IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Gerard J. Barry   )
)
Serial No.: 09/613,679   )
)
Filed: 11 July 2000   )
)
For: *DYNAMIC CURRENCY CONVERSION OF CARD PAYMENT SYSTEMS*)
)

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Mail Stop Appeal Brief – Patent
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Application of: **Gerard J. Barry**	Date: **28 September 2006**
Serial Number: **09/613,679**	Group Art Unit: **3624**
Filed: **11 July 2000**	Examiner: **Ella Colbert**
Title: *"Dynamic Currency Conversion of Card Payment Systems"*	Atty. Docket No.: **2270-010**

Assistant Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

APPELLANT'S BRIEF

Dear Sir:

This Brief is filed pursuant to a Notice of Appeal mailed 29 August 2006 in the matter of the above-identified application.

Real Party in Interest

Mainline Corporate Holdings, Limited, an Irish Company is the real party in interest and the assignee of this application.

Related Appeals and Interferences

Appellant is aware of no related appeals, interference, and/or other proceedings relevant to this discussion.

Status of Claims

Claims 1-8, 10, 12-23, 25-40, of which claims 1, 10, 23, and 37 are independent claims, are presented herein. Claims 1-8, 10, 12-23, 25-40 have been rejected, and claims 1-8, 10, 12-23, 25-40 are on appeal.

Appendix A provides a clean copy of all claims on appeal.

Claims 1, 3, 10, 12, 23, and 25 stand rejected under 35 U.S.C. 102(e) as being anticipated by Boesch et al., U.S. Patent No. 5,870,473 (hereinafter Boesch).

Claims 4-8, 13-16, and 26-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch in view of Boston, EP 0251619.

Claims 17-22 and 31-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch and Boston in view of Levine et al., WO 95/12169 (hereinafter Levine).

Although not expressly stated, claims 38-40 are presumed to be rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch and Boston in view of Levine.

Appendix B provides copies of the Boesch, Boston, and Levine references.

Status of Amendments

No amendments have been filed subsequent to the rejections set forth in a final Office Action, dated 1 June 2006.

Summary of Claimed Subject Matter

Appendix C provides copies of drawing sheets 1-10 containing FIGs. 1-10, some of which are discussed herein.

In accordance with at least one embodiment, the present invention pertains to a data processing method, data processing system, and a computer program for determining a preferred currency for association with a payment card transaction between a merchant and a payment card cardholder. This embodiment of the present invention is therefore directed at automatically determining the currency of a charge, debit or credit card used in a transaction between a cardholder and a merchant and associating the determined currency with the transaction, so that a cardholder may conduct the transaction in a currency which differs from the currency ordinarily used by the merchant, with no input required from the merchant.

The elements of each of the independent claims, mapped to the specification by page number and line number and mapped to the drawings, are presented below.

Independent Claim 1

The preamble of claim 1 recites a "data processing method performed in a data processing system for determining a preferred currency for association with a payment card transaction between a merchant and a payment card cardholder." The data processing method is generally discussed on page 10, line 6-31, and is illustrated in Figure 5. Figure 5 illustrates a flowchart of the operation of the present invention,

specifically a task 54, in combination with conventional methodology at a task 53. The data processing method is discussed in greater detail on page 14, line 16, through page 16, line 16, and is shown in FIG. 8. The software and/or hardware for performing the steps according to the invention are at a data processing system which may be a terminal, payment router, an authorization host, or any combination of these, as disclosed at page 12, lines 1-3.

A first claim element recites "obtaining the card number of the payment card." An obtaining operation 205 is discussed in the specification at page 14, lines 16-20, and is illustrated in FIG. 8. The card number is obtained when the merchant swipes 205 the card in the magnetic stripe reader of the point of sale terminal.

A second claim element recites "in said data processing system, identifying an identifier code from said card number." An operation 50 is discussed in the specification at page 10, lines 6-8, and shown in FIG. 5, in which an identifier code is extracted from the payment card details.

A third claim element recites "determining the operating currency for said identifier code by comparing said identifier code with entries in a table wherein each entry in said table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code." An operation 51 is discussed in the specification at page 10, lines 16-30, and is shown in FIG. 5. The identifier code is compared 51 with entries in a bank reference table, an example of which is shown in FIG. 6, which contains a list of issuer identifier codes.

Each issuer identifier code 60(1-n) in the table of FIG. 6 has an associated entry 61(1-n) containing an associated currency, which corresponds to the currency of payment cardholders accounts of the issuer. If an entry is found in the bank reference table for the identifier code, the operating currency is determined by extracting the associated currency corresponding to the issuer code. A similar operation 210 is discussed in the specification at page 14, lines 22-23, and is shown in FIG. 8. The terminal software searches through the Bank Reference table and checks 210 for an entry corresponding to the issuer (identifier) code from the card number to determine the operating currency.

A fourth claim element recites "setting the currency for association with the payment card transaction as the determined operating currency for the identifier code." The claimed setting element is discussed in general terms at page 10, lines 26-30, and elements 52, 53, and 54, shown in FIG. 5. The claimed setting element is discussed in the specification in more specific terms at page 14, lines 23-26, and shown in FIG. 8. That is, if an entry is found the currency for the operation is set 215 to that of the payment card. If no entry in the Bank Reference table is found the currency is set 220 to that of the merchant.

Independent Claim 10:

The preamble of claim 10 recites a "data processing system for determining a preferred currency for association with a payment card transaction, the payment card having a card number, between a merchant and a payment card cardholder." One data

processing system is exemplified as being a point of sale terminal 70 discussed in the specification on page 12, line 5, through page 13, line 14. The terminal 70 executes the methodology discussed in connection with claim 1 which is discussed in the specification at page 14, line 16, through page 16, line 16.

A first claim element of claim 10 recites "means for obtaining the card number of the payment card from the cardholder." The terminal includes a magnetic strip reader 71 and an alphanumeric and function keypad 72, which are discussed in the specification at page 12, lines 15-18, and shown in FIG. 7. Card details (card number, expiry date, and name of the cardholder) are obtained 205 either by swiping a payment card through the magnetic strip reader 71 or using the keypad 72.

A second claim element of claim 10 recites "means for identifying an identifier code from said card number." The terminal software includes code which caries out functions that include: modem control, card reading, bank reference table management, and so forth, as discussed in the specification at page 12, line 27, through page 13, line 31. The specification further discusses the terminal software obtains an identifier code from the card number at page 14, lines 23-26.

A third claim element of claim 10 recites "means for determining the operating currency for said identifier code by comparing said identifier code with entries in a table, wherein each entry in said table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code." The specification discusses the terminal software

searches through the Bank Reference table (shown in FIG. 6) and checks for an entry corresponding to the code obtained from the card number at page 14, lines 22-23.

A fourth claim element of claim 10 recites "means for setting the currency for association with the payment card transaction as the determined operating currency for the identifier code." Applicants specification teaches at page 14, lines 23-26 that if an entry is found the currency for the transaction is set 215 to that of the payment card. If no entry in the Bank Reference table is found the currency is set 220 to that of the merchant.

Independent Claim 23:

The preamble of claim 23 recites a computer program encoding a set of computer instructions for use in a computing device for determining a preferred currency for association with a payment card transaction, the payment card having a card number, between a merchant and a payment card cardholder. A first claim element of claim 23 recites a computer code section which when executed on the computing device obtains the card number of the payment card from the cardholder. A second claim element recites a computer code section which when executed on the computing device identifies an identifier code from said card number. A third claim element recites a computer code section which when executed on the computing device determines the operating currency for said identifier code, by comparing said identifier code with entries in a table, wherein each entry in said table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code. A fourth claim element recites a computer code section which when executed on the

computing device sets the currency for association with the payment card transaction as the determined operating currency for the identifier code.

The computer code sections correspond with the method operations recited in claim 1 and the specification teaches that software and/or hardware performs the steps according to the invention at page 12, lines 1-3. The claimed computer program is software. Similarly, the claimed computer code sections are also software. These code sections are discussed in terms of the methodology discussed on page 14, line 16, through page 16, line 16, and shown in FIG. 8. Consequently, these claim elements have been previously mapped to the specification and drawings above and are not repeated for brevity.

Independent claim 37:

The preamble of claim 37 recites a "method of operating a data processing system to conduct a financial transaction for the exchange of money provided by a payment card cardholder for a good or service provided by a merchant." The obtaining, identifying, and determining operations are similar to those set forth in connection with claim 1. Consequently, these claim elements have been previously mapped to the specification and drawings above and are not repeated for brevity.

A fourth element of claim 37 recites "indicating said operating currency as being a preferred currency of exchange for said financial transaction." This operation utilizes slightly different language than recited in claim 1. Nevertheless, the indicating operation is discussed in the specification at page

14, lines 23-26, wherein the preferred currency of exchange is indicated as 1)if an entry is found the currency for the transaction is set 215 to that of the payment card or 2) if no entry in the Bank Reference table is found the currency is set 220 to that of the merchant.

A fifth element of claim 37 recites "receiving a cardholder reply in response to said indicating activity" and a sixth element of claim 37 recites "completing said financial transaction in response to said receiving activity." A cardholder reply is discussed in the specification at page 15, lines 7-16 and is shown in FIG. 8. A reply by the cardholder entails a consent to or rejection of an offer at 270. When the cardholder consents to the offer at 270, the financial transaction is completed in the currency of the cardholder, as discussed in the specification at page 15, line 15, through page 16, line 16.

Dependent claims 3, 12, 25:

Claims 3, 12, and 25 share similar features. In particular, each of claims 3, 12, and 25 include the feature of the preferred currency being set to a default currency of the merchant when no operating currency can be determined for the identifier code. This feature is discussed in the specification at page 14, lines 24-26, and is shown in FIG. 8 at element 220.

Dependent claims 4, 14, 26:

Claims 4, 14, and 26 share similar features. In particular, each of claims 4, 14, and 26 include the features of the

cardholder being prompted as to whether the transaction is to be conducted in the preferred currency, converting the transaction amounts to equivalent amounts in the preferred currency, and presenting these amounts for review by the cardholder. This feature is discussed in the specification at page 15, lines 7-16, and is shown in FIG. 8 at elements 265, 270, and 275.

Dependent claims 5 and 27:

Claims 5 and 27 share similar features. In particular, each of claims 5 and 27 include the feature of at least one of the transaction amounts is converted to an equivalent amount in the preferred currency and is presented to the cardholder. This feature is discussed in the specification at page 16, line 6-16, and is shown in FIG. 8. A transaction slip is produced 260 which details transaction values in the merchant currency, transaction value in cardholders currency, and other information. A copy of this transaction slip is produced for the merchant and the cardholder.

Grounds of Rejection to Be Reviewed on Appeal

The 1 June 2006 Final Office Action rejects claims 1, 3, 10, 12, 23, and 25 under 35 U.S.C. 102(e) as being anticipated by Boesch. In addition, claims 4-8, 13-16, and 26-30 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch in view of Boston, and claims 17-22, 31-37, and 38-40 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch and Boston in view of Levine.

These rejections are formally delineated in the Status of Claims section of this document.

The following three grounds of rejection are presented for review:

1: Whether claims 1, 3, 10, 12, 23, and 25 are unpatentable under 35 U.S.C. 102(e) as being anticipated by Boesch.

2: Whether claims 4-8, 13-16, and 26-30 are unpatentable under 35 U.S.C. 103(a) over Boesch in view of Boston.

3: Whether claims 17-22 and 31-40 are unpatentable under 35 U.S.C. 103(a) over Boesch and Boston in view of Levine.

Arguments

Grounds of Rejection 1 -- Claims 1, 3, 10, 12, 23, and 25

Independent Claims 1, 10, and 23:

Regarding claim 1, the 1 June 2006 final Office Action to this application alleges that Boesch teaches a data processing method performed in a data processing system for determining a preferred currency for association with a payment card transaction between a merchant and a payment card cardholder. The final Office Action cites a passage at col. 11, lines 26-65, and Figures 4K and 5H as an alleged teaching of the claim 1 limitation of obtaining the card number of the payment card. The final Office Action cites a passage at col. 12, lines 16-18, as an alleged teaching of the claim 1 limitation of the data processing system, identifying an identifier code from the card number. In addition, the final Office Action cites a passage at col. 12, line 50, through col. 13, line 10, as an alleged teaching of the claim 1 limitation of determining the operating currency for the identifier code by comparing the identifier code with entries in a table, wherein each entry in the table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code. The final Office Action also cites a passage at col. 14, lines 17-30, as an alleged teaching of the claim 1 limitation of setting the currency for association with the payment card transaction as the determined operating currency for the identifier code.

Boesch discloses a sophisticated system under which customer purchases from merchants may be *securely* made over the Internet. The thrust of the disclosure is directed toward providing secure

communications. In one embodiment, the secure communications
occur through an electronic transfer system in which a customer
and a merchant can conduct a transaction whereby the customer
can purchase a product from the merchant and pay for the product
using electronic cash.

Boesch teaches of a customer paying for products with
electronic cash, and defines electronic cash as being a
representation of funds (real cash, credit, etc.), at col. 6,
lines 51-53. In order to pay for products with electronic cash,
Boesch further teaches that a customer "loads" funds associated
with a bound instrument (credit card, debit card, demand deposit
account, or other financial instruments) to a persona of the
customer user (col. 7, lines 53-58). The electronic cash is
subsequently "unloaded" (or transferred) from the persona of the
customer user to another bound instrument, such as that of a
merchant. In other words, funds are "loaded" into and
"unloaded" from a cash container (col. 21, lines 16-24).

The Boesch teaching of electronic cash is consistent with
conventional definitions of electronic cash, electronic money,
electronic currency, digital currency, and the like which refers
to money which is represented, held, and exchanged only in
electronic form. Some examples of the use of electronic cash
include internet/online banking, debit cards, online bill
payments and internet business. Disadvantages to the use of
electronic cash include fraud, failure of the technology,
possible tracking of individuals, and the like. Boesch attempts
to solve some of these problems by implementing a system and
method for increasing the efficiency of secure message
processing when paying for a product using electronic

funds/cash.

In contrast, Appellant's invention as defined in claim 1 is directed toward a method "for determining a preferred currency for association with a *payment card transaction* between a merchant and a payment card cardholder." Appellant describes a payment card transaction as a transaction in which a physical medium, i.e., a payment card, such as a credit card, charge card, debit card, and the like, is utilized by a cardholder of the payment card to make a purchase. Appellant's teaching is consistent with conventional definitions of the term payment card. In particular, a payment card covers a range of different cards that can be presented by a cardholder to make a payment. A payment card is typically backed by an account holding funds belonging to the cardholder or offering credit to the cardholder.

Consequently, the Boesch teaching of an electronic cash transaction (in which funds are "loaded" to a persona, or cash container, associated with a customer user) between a merchant user and a customer user is not a teaching of a "payment card transaction between a merchant and a payment card cardholder" as recited in independent claim 1. While the Office Action alleges that *Boesch* teaches a payment card transaction, this allegation is a distortion and misrepresentation of that which *Boesch* actually teaches. That is, the merchant user and customer user within the Boesch system engage in an electronic cash transaction, which is not a payment card transaction. Indeed, the merchant user has no knowledge of any particular payment card held by the payment card cardholder or other mode of payment other than electronic cash.

Nor is Boesch directed toward currency determination for a
payment card transaction between a merchant and a customer. The
"determining" operation of independent claim 1 determines the
operating currency for the identifier code by comparing the
identifier code with entries in a table wherein each entry in
the table contains an issuer identifier code or range of issuer
identifier codes and a corresponding currency code. The
"setting" operation of independent claim 1 then sets the
currency for association with the payment card transaction as
the determined operating currency for the identifier code.

Boesch does not teach Appellant's "determining" operation
despite Office Action allegations to the contrary. The passage
cited from Boesch at col. 12, line 50, through col. 13, line 10,
as an alleged teaching of Appellant's "determining" operation
discloses a portion of a server persona data structure 120 that
stores data relating to the customer users and merchant users
that have registered with the Boesch electronic transfer system.
A portion of the server persona data structure 120 is
illustrated in FIG. 4D. In particular, the cited passage and
associated FIG. 4D discloses a table of data illustrating fields
of instrument binding data 120H. A "persona" of the Boesch
reference is essentially a collection of data relating to a
specific customer user or merchant user. The instrument taught
by Boesch is a financial instrument, and may include a credit
card, debit card, demand deposit account (DDA), or the like.

Boesch teaches in the cited passage that instrument binding
data 120H includes a field 120H.16 having a flag indicating
whether the bound instrument is enabled for sale transactions,

and when field 120H.16 indicates that the bound instrument is enabled for sale transactions, a limit in customer user's chosen (i.e., native) currency is stored in field 120H.17. Instrument binding data 120H also includes a field 120H.18 indicating whether the bound instrument is enabled for credit/return transactions. A credit/return transaction is an operation where a merchant credits the customer persona 120.1 in lieu of providing the product originally agreed to. When field 120H.18 indicates that the bound instrument is enabled for credit/return transactions, a limit in customer user's chosen (native) currency, per credit/return transaction, is stored in a field 120H.19.

The Boesch instrument binding data 120H is illustrated as a table in Figure 4D, and of course, a table typically has entries. However, Appellant's determining operation of claim 1 recites determining the operating currency for the identifier code by comparing the identifier code with entries in a table wherein _each_ entry in the table contains an issuer identifier code or a range of issuer identifier codes and a corresponding currency code. Thus, even if one somehow equates the data structure 120 of instrument binding data 120H with Appellant's claimed table, the instrument binding data 120H is still lacking entries wherein each entry contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code. Rather, the Boesch table/data structure merely indicates that a user's chosen (native) currency for some operations may be specified. As stated in W.L. Gore & Associates v. Garlock Inc., 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984):

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration.

Boesch simply does not anticipate Appellant's invention of claim 1 because Boesch does not disclose a payment card transaction between a merchant and a payment card cardholder. Moreover, since the Boesch table of instrument binding data 120H is lacking the claimed entries wherein each entry in the table contains an issuer identifier code or a range of issuer identifier codes and a corresponding currency code, no comparison can be made between an identifier code identified from the card number of the payment card and these absent entries in order to determine the operating currency for the identifier code. As such, the rejection of independent claim 1 under 35 U.S.C. §102(a) was improper.

Nor is Appellant's invention as defined in claim 1 obvious in view of Boesch. It should be noted that an "identifier code" is defined in Appellant's specification as the portion of a card number of a payment card which distinguishes it between card issuers. An "issuer identifier code" is defined in Appellant's specification as a code contained in Appellant's claimed table, also known as a bank reference table ('BRT'). This issuer identifier code is associated with a currency in the claimed table. The associated currency corresponds to the currency of the payment card cardholder accounts for the issuer identified by the issuer identifier code. Thus, Appellant's claimed table (BRT) contains multiple entries of issuer identifier codes and corresponding currency codes.

The *Boesch* reference teaches that a customer-merchant

transaction may take place in a multiple currency environment. But that teaching falls far short of suggesting how the currency is set, as recited in claim 1. <u>How</u> the currency is set, in accordance with claim 1, is through a comparison made between the identifier code from the card number of the payment card and entries presented in the table to determine an operating currency.

In contrast, Boesch expressly teaches <u>how</u> a currency is set for the Boesch system and that is through explicit customer entry of a default currency by the customer user during a registration process (col. 80, lines 5-26). This registration process occurs prior to binding a financial instrument, such as a bank account, credit card, or debit card, for use during electronic cash transactions. Consequently, the Boesch default currency corresponds with the customer user's chosen preference regardless of any financial instrument bound to that customer's persona in the Boesch electronic transfer system.

Therefore, no table of entries containing issuer identifier codes and corresponding currency codes, such as that recited in claim 1, is required in the system of Boesch. The explicit customer entry of a default currency during a registration process as taught by Boesch suggests away from Appellant's invention of claim 1 in which a comparison is made between the identifier code identified from the card number of the payment card and entries in the table to determine an operating currency, and the currency is set for association with the payment card transaction as the determined operating currency.

The invention of claim 1 is directed to a method for

automatically determining a preferred currency for association
with a payment card transaction that requires no user input.
The automatic character of the claimed data processing method is
intrinsic as a result of performing the claimed steps of
obtaining, identifying, determining the operating currency
utilizing a table containing issuer identifier codes and
corresponding currency codes, and setting the currency for the
payment card transaction as the determined operating currency
for the identifier code. The pre-emptive, explicit customer
entry of a default currency in the Boesch system during a
registration process before conducting any transaction is not
automatic since input from the customer/user/cardholder at a
stage preceding a transaction is necessary.

For the purposes of the Boesch system, explicit customer
entry of a default currency during a registration process
executed prior to binding a particular financial instrument
(bank account, credit card, debit card, etc.) is sufficient.
That is, there is no motivation or suggestion to modify the
Boesch system to include Appellant's claimed table containing
entries of issuer identifier codes and a corresponding currency
codes because such a table would serve no purpose in the Boesch
system.

It is only Appellant's specification that teaches of a data
processing method performed in a data processing system for
determining a preferred currency for association with a payment
card transaction between a merchant and a payment cardholder, as
recited in claim 1. Moreover, it is only Appellant's
specification that teaches of determining the operating currency
for an identifier code identified from a card number of the

payment card by comparing the identifier code with entries in a table wherein each entry in the table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code, and setting the currency for association with the payment card transaction as the determined operating currency for the identifier code. Appellant's invention of claim 1 provides means by which a cardholder can be sure of an exact value of a payment card transaction when traveling abroad by allowing the cardholder to make payments and/or view a transaction amount in their home currency rather than in the currency of the merchant with whom they are conducting business. Consequently, Appellant's invention as defined in claim 1 is not rendered obvious in view of the *Boesch* reference.

Unlike claim 1, claim 10 is expressed in the terms of a system. But in spite of certain differences, claims 1 and 10 share some similar features. For example, claim 10 includes the limitations of means for determining the operating currency for the identifier code by comparing the identifier code with entries in a table, wherein each entry in the table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code, and means for setting the currency for association with the payment card transaction as the determined operating currency for the identifier code. Accordingly, claim 10 is neither anticipated by nor rendered obvious in view of Boesch for substantially the same reasons as are set forth above in connection with claim 1.

Unlike claim 1, claim 23 is expressed in the terms of a computer program. But in spite of certain differences, claim 23

also shares some similar features with claim 1, including the features generally discussed above in connection with claim 1. Accordingly, claim 23 is neither anticipated by nor rendered obvious in view of Boesch for substantially the same reasons as are set forth above in connection with claim 1.

For the reasons set forth above, the rejection of independent claims 1, 10, and 23 under 35 U.S.C. §102(e) as being anticipated by Boesch was improper. In addition, claims 1, 10, and 23 are not obvious in view of Boesch. Appellant therefore believes independent claims 1, 10, and 23 to be allowable. Accordingly, the Board is respectfully requested to reconsider claims 1, 10, and 23.

Claims 3, 12, and 25:

Claim 3 depends from independent claim 1. While the previous discussion was specifically directed to independent claim 1, the limitations of claim 1 are read into dependent claim 3. Accordingly, claim 3 is believed to be allowable by reason of dependency. Claim 3 also includes the further limitation wherein the preferred currency is set to a default currency of the merchant when no operating currency can be determined for the identifier code. The Final Office Action cites a passage in Boesch at col. 13, lines 3-33 as an alleged teaching of Appellant's invention of claim 3.

As discussed in detail in connection with claim 1, no operating currency can be determined for the identifier code, because Boesch fails to teach or suggest Appellant's limitations of claim 1 of comparing the identifier code with entries in a

table, and each entry containing an issuer identifier code or range of issuer identifier codes and a corresponding currency code.

In addition, Appellant respectfully disagrees with the Office Action allegation that Boesch teaches the further limitation of claim 3. There is no teaching or suggestion within the Boesch reference of setting the preferred currency of the merchant because there is no table taught by Boesch that even remotely resembles Appellant's claimed table having entries wherein each entry in the table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code.

The passage cited in col. 13, lines 3-33, as an alleged teaching of Appellant's limitations of claim 3 merely indicates that within the set of fields 120H.1-120H.28 that store data for each financial instrument bound to customer persona 120.1, and particularly within fields 120H.19, 120H.21, and 120H.23, certain limits may be set in a <u>customer user's chosen native currency</u>. The passage further teaches that if a native currency does not exist, the limit may be set in U.S. dollars. However, the customer user's chosen native currency is not a teaching of the preferred currency being set to a default currency of the merchant when no operating currency can be determined for the identifier code, as recited in claim 3, because the merchant need not have the same currency as the customer user. Likewise, the currency set in U.S. dollars is not a teaching of the preferred currency being set to a default currency of the merchant when no operating currency can be determined for the identifier code because the merchant need not be a U.S. merchant that deals in U.S. currency. As stated in <u>W.L. Gore &</u>

Associates, Inc. v. Garlock, Inc., 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert denied, 469 U.S. 851 (1984):

> To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

It would be through hindsight gained through an understanding of Appellant's specification and claims that one could even consider setting a preferred currency to a default currency of the merchant when no operating currency can be determined for the identifier code especially in the absence of a teaching or suggestion of Appellant's claimed table having entries wherein each entry in the table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code. Of course, it is improper to use hindsight in making an obviousness rejection. Consequently, Appellant believes that Boesch fails to teach or suggest the limitations of claim 3.

Claim 12 depends from independent claim 10, and claim 25 depends from independent claim 23. Appellant therefore believes claims 12 and 25 to be allowable by reason of dependency. In addition, claims 12 and 25 share similar features with claim 3. Consequently, Appellant believes that Boesch fails to teach or suggest the limitations of claims 12 and 25 for the reasons set forth in connection with claim 3.

For the reasons set forth above, the rejection of claims 3, 12, and 25 under 35 U.S.C. §102(e) as being anticipated by Boesch was improper. Nor are claims 3, 12, and 25 rendered

obvious in view of Boesch. Appellant therefore believes claims 3, 12, and 25 to be allowable. Accordingly, the Board is respectfully requested to reconsider claims 3, 12, and 25.

Grounds of Rejection 2 -- Claims 4-8, 13-16, and 26-30

Claims 4-8, depend directly or indirectly from independent claim 1. While the previous discussion was specifically directed to independent claim 1, the limitations of claim 1 are read into dependent claims 4-8. Accordingly, claims 4-8 are believed to be allowable by reason of dependency. Claims 13-16 depend directly or indirectly from independent claim 10. Accordingly, claims 13-16 are also believed to be allowable by reason of dependency. Similarly, claims 26-30 depend from independent claim 23, and are also believed to be allowable by reason of dependency. In addition, claims 4-8, 13-16, and 26-30 are allowable for independent reasons.

Claims 4, 14, and 26:

Claim 4 includes the limitation wherein the cardholder is prompted as to whether the transaction is to be conducted in the preferred currency, including the steps of converting the transaction amounts to equivalent amounts in the preferred currency and presenting these amounts for review by the cardholder.

The final Office Action acknowledges that Boesch fails to teach the limitations of claim 4. However, the final Office Action alleges that Boston teaches the features of claim 4, citing a passage on page 5, paragraphs 3 and 4, and concludes

that it would have been obvious to modify Boesch to include the
alleged teaching of Boston because such a modification would
allow Boesch to have the transaction amount expressed in the
foreign currency using the associated conversion rate.

The present invention is concerned with effecting
transactions in a multicurrency environment. Within the context
of the present invention, for any individual merchant,
individual transactions may take place using any one of a number
of different currencies. As is discussed in more detail below,
Appellant's claims define an invention that permits a payment
card transaction to take place between a merchant and a customer
using the customer's preferred currency.

Boston does not disclose such a system. Rather, Boston
discloses a system in which transactions take place exclusively
in the currency of the merchant. More specifically, Boston
fails to provide any teachings pertaining to converting the
transaction amounts to equivalent amounts in the preferred
currency and presenting these amounts for review by the
cardholder, as recited in claim 4. Instead, Boston teaches the
opposite.

Boston discloses a transaction card that includes a processor
and a memory in which a transaction limit represented in a base
currency and one or more rates for converting the base currency
into different foreign currencies can be stored. The Boston
card is further configured with data input means for allowing
the cardholder to select the desired currency and for updating
the transaction limit and conversion rates. The passage on page
5, paragraphs 3 and 4, of the Boston reference cited in the

final Office Action teaches that when a transaction is to be carried out in a foreign currency, the processor will convert the transaction limit from the base currency into a transaction limit represented in the foreign currency using the associated conversion rate. The Boston system can then compare a transaction amount expressed in the foreign currency and supplied through data entry to the converted transaction limit to determine if the transaction should be approved. Thus, the multi-currency capability of the Boston system is limited to expressing a transaction limit in one or more of several currencies, for verifying and/or validating a transaction, possibly as part of a transaction authorization procedure. That is, Boston does not associate the currency of the card with the transaction, i.e., change the currency of the transaction from the merchant currency to the cardholder currency at the point of sale.

The Boston transaction amounts are not converted to equivalent amounts in the preferred currency. Rather, the cardholder enters the foreign currency and transaction limits in the base currency. The transaction limits are subsequently converted from the base currency to the foreign currency. The converted transaction limits are then compared with the unconverted transaction amounts in the foreign currency. Since the Boston transaction amounts are not converted to equivalent amounts in the preferred currency, as recited in claim 4, it follows that these equivalent amounts cannot be presented for review by the cardholder, as also recited in claim 4.

Well-established patent practice dictates that a combination of prior art references cannot render obvious that which none of

the prior art teaches or suggests. As stated in In re Wood, 202
USPQ 171, 174, (C.C.P.A. 1979):

> The test for obviousness is not whether the features
> of one reference may be bodily incorporated into another
> reference....Rather, we look to see whether combined
> teachings render the claimed subject matter obvious.

Accordingly, the proper evaluation for determining
patentability is to consider whether the prior art, and not
Appellant's specification, suggests modifications which make the
prior art methodology more closely resemble Appellant's data
processing method and system. Moreover, proper evaluation for
determining patentability is to consider whether combined
teachings render the claimed subject matter obvious.

Claim 4 recites operations that go beyond anything disclosed
or suggested in either Boesch or Boston. Accordingly, together
Boesch and Boston cannot be interpreted to suggest that which
neither alone suggests. As such, claim 4 is believed to be
allowable for the reasons set forth above. Claims 13 and 26
share similar features with claim 4. Consequently, a
combination of Boesch and Boston fails to render obvious the
inventions of claims 13 and 26 for the reasons set forth in
connection with claim 4 and claims 13 and 26 are believed to be
allowable. The Board is respectfully requested to reconsider
claims 4, 13, and 26.

Claims 5-7 and 27-29:

Claim 5 includes the limitation wherein at least one of the
transaction amounts is converted to an equivalent amount in the
preferred currency and is presented to the cardholder. Claim 5

is believed to be allowable for reasons similar to those set forth in claim 4. As explained above, it is the transaction limits that are converted from the base currency to the foreign currency, as opposed to the at least one of the transaction amounts which are actually converted to an equivalent amount in the preferred currency, as recited in claim 5. The converted transaction limits are then compared with the unconverted transaction amounts in the foreign currency.

Since the Boston transaction amount(s) are not converted to an equivalent amount in a preferred currency, as recited in claim 5, it follows that the equivalent amount in the preferred currency cannot be presented to the cardholder, as also recited in claim 5.

Claim 5 recites operations that go beyond anything disclosed or suggested in either Boesch or Boston. Accordingly, together Boesch and Boston cannot be interpreted to suggest that which neither alone suggests. As such, claim 5 is believed to be allowable for the reasons set forth above. Claim 27 shares similar features with claim 5. Consequently, a combination of Boesch and Boston fails to render obvious the invention of claim 27 for the reasons set forth in connection with claim 5 and claim 27 is believed to be allowable.

Claims 6 and 7 depend from claim 5 and are believed allowable for the reasons set forth above in connection with claims 1 and 5. Likewise, claims 28 and 29, depend from claim 27 and are believed allowable for the reasons set forth above in connection with claims 23 and 27. Accordingly, the Board is respectfully requested to reconsider claims 5-7 and 27-29.

Grounds of Rejection 3 -- Claims 17-22 and 31-40

Claims 31 and 32, depend from independent claim 1 and the limitations of claim 1 are read into dependent claims 31 and 32. Accordingly, claims 31 and 32 are believed to be allowable by reason of dependency. Claims 17-22, 33, and 34 depend directly or indirectly from independent claim 10. Accordingly, claims 17-22, 33, and 34 are also believed to be allowable by reason of dependency. Similarly, claims 35 and 36 depend from independent claim 23, and are also believed to be allowable by reason of dependency. Independent claim 37 includes features similar to those set forth in connection with claim 1, and is believed to be allowable for the reasons set forth in connection with claim 1. Claims 38-40 depend directly or indirectly from claim 37, and are believed allowable by reason of dependency.

Levine teaches a method and apparatus for distributing currency. Levine specifically teaches a magnetic stripe, electronic traveler's check (ETC) card issued to a customer and having a customer-selectable monetary value. The customer-selectable monetary value is configured with an encoded card number, including a bank identification number and an account number.

The ETC taught by Levine allows persons who have purchased the ETC to make cash withdrawals or cash transfers from automatic teller machines (ATM's) or other cash-dispensing terminals (see *Levine* at the abstract and page 3 lines 2 to 11). In a multicurrency environment, the ATM machine with which the ETC is being used sends the ETC's bank identification number and

a code indicating the currency of the ATM to a "VisaNet" computer. Thus, two different currencies may be involved, one for the ATM and another for the ETC. Levine's VisaNet computer then provides any currency conversion needed (see Levine at page 7, lines 29-33). This is the opposite of what Appellant claims. A currency conversion is needed in Levine because the Levine transaction is performed exclusively using the ATM's currency. Nothing in Levine teaches or suggests any feature that would allow the transaction to be performed using any other currency than that of the ATM (such as, Appellant's claimed preferred currency). The Levine system does not associate the card currency with the transaction, i.e., change the currency of the transaction from the merchant currency to the cardholder currency at the point of sale. If Levine permitted the transaction to take place in the ETC's currency, then in contrast to the teaching of Levine, no currency conversion would need to take place.

Again, within the context of a multicurrency environment of the present invention, for any individual merchant, individual transactions may take place using any one of a number of different currencies. That is, Appellant's claims define an invention that permits a payment card transaction to take place between a merchant and a customer using the customer's preferred currency. Like Boston, Levine does not disclose such a system. Rather, Levine discloses a system in which transactions take place exclusively in the currency of the merchant.

Consequently, the teaching of Levine does not further the teaching of Boesch and/or Boston with respect to these features, as discussed above and claims 17-22 and 31-40 are believed to be

allowable. Accordingly, the Board is respectfully requested to reconsider claims 17-22 and 31-40.
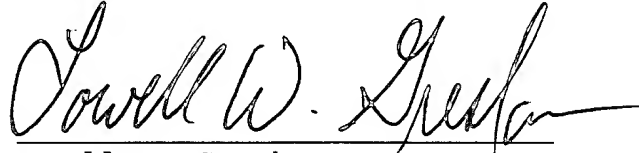
Conclusion

Claims 1, 3-8, 10, 12-23, and 25-40 are included in this Appeal.

The rejection of claims 1, 3, 10, 12, 23, and 25 under 35 U.S.C. 102(e) as being anticipated by Boesch is believed to be improper. Likewise, the rejection of claims 4-8, 13-16, and 26-30 under 35 U.S.C. 103(a) as being unpatentable over Boesch in view of Boston is believed to be improper, and the rejection of claims 17-22 and 31-40 under 35 U.S.C. 103(a) as being unpatentable over Boesch and Boston in view of Levine is believed to be improper. In general, the references are silent as to any articulated or implied motivation for the modifications suggested in the Office Action. In addition, the references are silent as to all of the features of the claimed invention. However, a failure to teach or suggest all of the claimed features, lack of a suggestion for combination, and hindsight are improper standards for holding claims to be unpatentable.

Appellant believes that the arguments above fully respond to every outstanding ground of rejection and that the contested claims should be found allowable.

Respectfully submitted,

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<u>Appendix A -- Claims on Appeal</u>

This Appendix is thirteen pages, including this cover page, and contains a clean double-spaced copy of the claims on appeal.

Claim 1:   A data processing method performed in a data processing system for determining a preferred currency for association with a payment card transaction between a merchant and a payment card cardholder, said method including the steps of:

obtaining the card number of the payment card;

in said data processing system, identifying an identifier code from said card number;

determining the operating currency for said identifier code by comparing said identifier code with entries in a table wherein each entry in said table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code; and

setting the currency for association with the payment card transaction as the determined operating currency for the identifier code.

Claim 3:   A method according to claim 1, wherein the preferred currency is set to a default currency of the merchant when no operating currency can be determined for the identifier code.

Claim 4:   A method according to claim 1, wherein the cardholder is prompted as to whether the transaction is to be

conducted in the preferred currency, including the steps of

converting the transaction amounts to equivalent amounts in the

preferred currency and presenting these amounts for review by

the cardholder.

Claim 5: A method according to claim 1, wherein at least

one of the transaction amounts is converted to an equivalent

amount in the preferred currency and is presented to the

cardholder.

Claim 6: A method according to claim 5, further comprising

the step of presenting an exchange rate to the cardholder, said

exchange rate corresponding to a rate between the merchant's

currency and the preferred currency.

Claim 7: A method according to claim 5, wherein the

transaction details in the merchant's currency are also

presented to the cardholder.

Claim 8: A method according to claim 1, further comprising

the step of initially checking to determine if the transaction

amount exceeds a predetermined minimum level for processing in

an alternative currency to that of the merchant's currency.

Claim 10:   A data processing system for determining a preferred currency for association with a payment card transaction, the payment card having a card number, between a merchant and a payment card cardholder, said means comprising;

means for obtaining the card number of the payment card from the cardholder,

means for identifying an identifier code from said card number,

means for determining the operating currency for said identifier code by comparing said identifier code with entries in a table, wherein each entry in said table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code, and

means for setting the currency for association with the payment card transaction as the determined operating currency for the identifier code.

Claim 12:   A data processing system according to claim 10, further comprising means for setting the preferred currency to the default currency of the merchant when no operating currency can be determined for the identifier code.

Claim 13:   A data processing system according to claim 10, further comprising prompting means for prompting the cardholder

as to whether the transaction is to be conducted in the preferred currency, said prompting means comprising conversion means for converting the transaction amounts to equivalent amounts in the preferred currency and presenting these amounts for review by the cardholder.

Claim 14: A data processing system according to claim 13, further comprising means for accepting an indication from the cardholder as to whether the transaction is to proceed in the preferred currency and means for permitting the transaction to be processed in the preferred currency if such an indication is received.

Claim 15: A data processing system according to claim 10, further comprising conversion means for converting at least one of the transaction amounts to an equivalent amount in the preferred currency and presenting this converted amount to the cardholder, optionally comprising means for presenting an exchange rate to the cardholder, said exchange rate corresponding to a rate between the merchant's currency and the preferred currency.

Claim 16: A data processing system according to claim 10, further comprising means for initially checking to determine if

the transaction amount exceeds a predetermined minimum level for processing in an alternative currency to that of the merchant's currency.

Claim 17: A data processing system according to claim 10, wherein said data processing system is embodied in a payment card terminal.

Claim 18: A data processing system according to claim 10, wherein said data processing system is embodied in a central payment router.

Claim 19: A data processing system according to claim 10, wherein said data processing system is embodied in an authorisation host, optionally in co-operation with another system.

Claim 20: A data processing system according to claim 19, wherein said other system is a payment card terminal or central payment router.

Claim 21: A data processing system according to claim 10 further comprising means for connecting to a node in a computer network.

Claim 22: A data processing system according to claim 21, wherein the card number is received via the computer network.

Claim 23: A computer program encoding a set of computer instructions for use in a computing device for determining a preferred currency for association with a payment card transaction, the payment card having a card number, between a merchant and a payment card cardholder, comprising

a computer code section which when executed on the computing device obtains the card number of the payment card from the cardholder,

a computer code section which when executed on the computing device identifies an identifier code from said card number,

a computer code section which when executed on the computing device determines the operating currency for said identifier code, by comparing said identifier code with entries in a table, wherein each entry in said table contains an issuer identifier code or range of issuer identifier codes and a corresponding currency code, and

a computer code section which when executed on the computing device sets the currency for association with the payment card transaction as the determined operating currency

for the identifier code.

Claim 25: A computer program according to claim 23, comprising a computer code section which when executed on the computing device sets the preferred currency to the default currency of the merchant when no operating currency can be determined for the identifier code.

Claim 26: A computer program according to claim 23, having a computer code section which when executed on the computing device prompts the cardholder as to whether the transaction is to be conducted in the preferred currency, including converting the transaction amounts to equivalent amounts in the preferred currency and presenting these amounts for review by the cardholder.

Claim 27: A computer program according to claim 23, comprising a computer code section which when executed on the computing device converts at least one of the transaction amounts to an equivalent amount in the preferred currency and presents the converted amount to the cardholder.

Claim 28: A computer program according to claim 27, comprising a code section which when executed on the computing

device presents an exchange rate to the cardholder, said

exchange rate corresponding to a rate between the merchant's

currency and the preferred currency.

Claim 29: A computer program according to claim 27,

comprising a computer code section which when executed on the

computing device presents the transaction details in the

merchant's currency to the cardholder.

Claim 30: A computer program according to claim 23,

comprising a code section which when executed on the computing

device initially checks to determine if the transaction amount

exceeds a predetermined minimum level for processing in an

alternative currency to that of the merchant's currency.

Claim 31: A method according to claim 1, wherein the card

holder is prompted as to whether the transaction is to be

conducted in the preferred currency, including the steps of

converting the transaction amounts to equivalent amounts in the

preferred currency and presenting an exchange rate to the

cardholder, said exchange rate corresponding to a rate between

the merchant's currency and the preferred currency.

Claim 32: A method according to claim 1, wherein the card

holder is prompted as to whether the transaction is to be

conducted in the preferred currency, including the steps of

converting the transaction amounts to equivalent amounts in the

preferred currency, presenting said equivalent amounts for

review by the cardholder, and presenting an exchange rate to the

cardholder, said exchange rate corresponding to a rate between

the merchant's currency and the preferred currency.

Claim 33: A data processing system according to claim 10,

further comprising prompting means for prompting the cardholder

as to whether the transaction is to be conducted in the

preferred currency, said prompting means comprising means for

presenting an exchange rate to the cardholder, said exchange

rate corresponding to a rate between the merchant's currency and

the preferred currency.

Claim 34: A data processing system according to claim 10,

further comprising prompting means for prompting the cardholder

as to whether the transaction is to be conducted in the

preferred currency, said prompting means comprising:

conversion means for converting the transaction amounts to

equivalent amounts in the preferred currency and presenting

these amounts for review by the cardholder; and

means for presenting an exchange rate to the cardholder,

said exchange rate corresponding to a rate between the merchant's currency and the preferred currency.

Claim 35: A computer program according to claim 23, having a computer code section which when executed on the computing device prompts the cardholder as to whether the transaction is to be conducted in the preferred currency, including presenting an exchange rate to the cardholder, said exchange rate corresponding to a rate between the merchant's currency and the preferred currency.

Claim 36: A computer program according to claim 23, having a computer code section which when executed on the computing device prompts the cardholder as to whether the transaction is to be conducted in the preferred currency, including converting the transaction amounts to equivalent amounts in the preferred currency, presenting these equivalent amounts for review by the cardholder and presenting an exchange rate corresponding to a rate between the merchant's currency and the preferred currency.

Claim 37: A method of operating a data processing system to conduct a financial transaction for the exchange of money provided by a payment card cardholder for a good or service provided by a merchant, said method comprising:

obtaining a card number from said payment card;

identifying, in said data processing system, an identifier

code from said card number;

determining an operating currency for said identifier code

by comparing said identifier code with entries in a table that

associates issuer identifier codes with currency codes;

indicating said operating currency as being a preferred

currency of exchange for said financial transaction;

receiving a cardholder reply in response to said indicating

activity; and

completing said financial transaction in response to said

receiving activity.

Claim 38: A method as claimed in claim 37 wherein:

said cardholder reply instructs said data processing system

to conduct said financial transaction using said preferred

currency; and

said completing activity completes said financial

transaction using said preferred currency.

Claim 39: A method as claimed in claim 38 wherein:

said indicating activity additionally indicates a currency

exchange rate for converting from a merchant currency to said

preferred currency; and

said completing activity uses said currency exchange rate

in completing said financial transaction.

Claim 40: A method as claimed in claim 38 wherein said

indicating activity additionally indicates a first amount of

money for said financial transaction using a merchant currency

and a second amount of money for said financial transaction

using said preferred currency.

Appendix B -- Evidence

This Appendix is one hundred and sixty-five pages, including this cover page, and contains clean copies of all evidence (i.e., prior art references) under consideration. This evidence is listed below:

	Patent	U.S. Pat. No.	Pages
1:	Boesch et al.	5,870,473	124
2:	Boston	EP 0251619	13
3:	Levine et al.	WO 95/12169	27

EUROPEAN PATENT SPECIFICATION

(54) **Portable transaction card.**

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Description

Technical Field

The subject invention relates to a portable transaction card having an internal microprocessor. The subject card is capable of approving transactions in foreign currencies.

Background of the Invention

In recent years, there has been a strong trend towards a cashless society. To this end, large transaction card networks have been developed for purchasing goods and services. Along with widespread use of transaction cards there has also developed concurrent fraud losses. To combat these losses, a number of schemes have been implemented. The most common scheme is to print lists of cards which have been lost or stolen or whose holders have exceeded their assigned credit limits. When a card is presented during a transaction, the user's account number is compared with the circulated list to determine if the transaction should be authorized. This approach suffers from many drawbacks, not the least of which is the fact that the printed lists are always somewhat out of date.

In order to overcome these shortcomings, a sophisticated network of on-line transaction terminals have been placed in merchant locations for authorizing transactions. In this system, the card number and transaction amount are entered into the terminal. The terminal then transmits that information to the card issuer which determines if the transaction should be approved. The approval decision can be based on a number of factors. For example, the account number can be compared with a current list of lost or stolen cards. The transaction amount could also be compared to maximum transaction limit for that cardholder based on his credit worthiness or current deposits.

While the above described on-line system is inherently more reliable than the distributed card list, it also has drawbacks. For example, the network requires numerous communication links which give rise to significant carrier costs. In addition, where large distances are involved, the response time can be less than satisfactory from both a customer and merchant standpoint.

Various approaches have been implemented to reduce these problems. As described in U.S. Patent No. 4,485,300, issued November 27, 1984 to Peirce, approval parameters supplied by the card issuer can be distributed to local area processors such that communication costs can be reduced. Another enhancement technique is described in the earlier European Patent Application No. 86 302

120.0, publication no. 0 200 343, wherein approval information is stored on the card itself. This approval information is stored and acted upon by the transaction terminal located at the merchant. In this manner, certain approvals can be completed in an off-line manner, that is, where there is no connection to either the issuer or a central processor. The above cited patent and application are both assigned to the assignee of the subject invention and the disclosures therein are incorporated by reference.

One method of implementing the off-line approval system described in publication no. 0 200 343, cited above is to encode the authorization data on a magnetic stripe formed on the card. More sophisticated off-line approval procedures can be performed where the transaction card is provided with an internal microprocessor and memory.

The first cards containing microprocessors, called smart cards, were developed approximately ten years ago and are used to a great extent in the European community. These cards typically include electrical contacts to provide an interface with a local transaction terminal. Information about the cardholder and associated transaction parameters can be stored and updated inside the card. By reading this information the terminal can carry out an off-line authorization procedure.

At the present time, smart cards are becoming very sophisticated, such that the authorization procedure can be carried out in the card itself. For example the card can store a dollar amount which would represent the maximum amount of a transaction that could be authorized. During the transaction, the transaction amount could be entered into the smart card via the terminal. The microprocessor in the card can then compare transaction amount with the stored transaction limit to determine if the transaction should be approved. If the transaction is approved, an approval code would be generated and supplied to the customer and merchant.

The use of smart cards can further reduce communication costs, time delays and fraud losses. Unfortunately, this approach is not geared towards international travel where one cardholder will be dealing with varying currencies. As can be appreciated, the transaction limit is stored in the card in the form of a local or base currency, while purchases might be priced in a different, foreign currency. In this case, it would be impossible for the microprocessor in the card to make the comparison necessary for authorization. Accordingly, it would be desirable to provide an improved transaction card which could operate with foreign currencies.

In the prior art, a number of devices have been

made which aid in currency conversion. For many years, mechanical, slide rule-type devices have been designed to aid the traveler in converting currency. More recently, a number of microprocessor based devices have been developed for electronically converting an amount from one currency to another.

One example of a microprocessor driven currency converter is disclosed in German application No. 3410065, laid open October 31, 1984. In this reference, it is suggested that a microprocessor-driven currency converter could be integrated in objects of frequent daily use, such as wrist watches. (See also German applications No. 2923478, laid open December 11, 1980, and No. 2905190, laid open August 21, 1980.) The above disclosures evidence the need of a traveler to easily convert currencies to facilitate a cash purchase. However, to date, this need has not been addressed for purchases made with a transaction card. More specifically, no transaction card has been developed with the ability to convert a stored transaction limit to a foreign currency and then perform an internal authorization procedure.

Accordingly, it is an object of the subject invention to provide a new and improved transaction card capable of authorizing a transaction in a foreign currency.

It is another object of the subject invention to provide a new and improved transaction card which includes a means for entering a conversion rate to permit the conversion of a stored transaction limit to a foreign currency.

It is still another object of the subject invention to provide a new and improved transaction card which can be readily used in foreign countries.

It is still a further object of the subject invention to provide a new and improved transaction card which can generate an approval of a transaction in a foreign currency without connection to a central processor.

Summary of the Invention

In accordance with these and many other objects, the subject transaction card includes a storage means for holding a transaction limit represented in a base currency, such as dollars. The storage means also holds rates for converting the base currency into different foreign currencies. A data entry means is provided for supplying the transaction limit and the conversion rates to the storage means.

In accordance with the subject invention as disclosed in Claim 1, a processor means is connected to the data entry means and storage means and functions such that when a transaction is to be carried out in a currency other than the base currency, the processor means will convert the transaction limit stored in the base currency into the foreign currency using the associated conversion rate. Thereafter, the transaction amount expressed in the foreign currency and entered through the data entry means is compared to the converted transaction limit to determine if the transaction should be approved.

It is believed that the smart cards presently available contain all of the hardware necessary to carry out the basic concept of the subject invention. In the existing smart cards, the data entry means is defined by electronic contacts which interface with a transaction terminal. In the preferred and illustrated embodiment of the subject invention, the transaction card can carry out the authorization procedure independently of the terminal and is provided with its own data entry means, in the form of a key pad and an LCD display.

In the preferred embodiment of the subject transaction card, the key pad is activated to select the currency used in the particular transaction. This selection will cause the microprocessor to convert the stored transaction limit to the selected currency. The transaction amount is entered through the key pad and an approval code is generated internally and shown on the display means. This approval code can be noted on a sales draft for future reference.

Further objects and advantages will be apparent from the following detailed description taken in conjunction with the drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a plan view of a transaction card formed in accordance with the subject invention.

Figure 2 is a schematic diagram illustrating the components of a transaction card of the subject invention.

Figure 3 is a flow chart illustrating the steps taken to enter the currency conversion rates into a transaction card formed in accordance with the subject invention.

Figure 4 is a flow chart illustrating the steps taken to select a foreign currency in accordance with the subject invention.

Figure 5 is a flow chart illustrating the steps taken to carry out a transaction in a foreign currency in accordance with the subject invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figures 1 and 2, there is illustrated a transaction card having the elements necessary to carry out the objects of the subject invention. A more complete description of a card suitable for

this type of application can be found in the earlier European Patent Application No. 86 302 094.7, publication no. 0 203 683.

As disclosed in the latter application, a significant body of published literature exists regarding the fabrication of microprocessor based transaction cards or smart cards. The objects of the subject invention can be obtained by modifying any of a number of the existing prior art smart cards. Accordingly, the disclosure herein will be limited to a discussion of the modifications necessary to carry out the stated objects of the subject invention.

As shown in Figure 2, the card 10 of the subject invention will include a microprocessor 20 which is connected to storage means. In the illustrated embodiment, the storage means is defined by a masked program ROM 22 and RAM 24. The masked program ROM 22, which is typically part of the microprocessor, will include the basic operating instructions of the transaction card. ROM 22 can also include default programs to allow the transaction card to operate in other modes, such as a conventional calculator.

RAM space 24 is provided as temporary storage and to facilitate interfacing between the inputs of the key pad and electrical contacts. In the preferred embodiment, additional storage in the form of an EEPROM 30 is provided for holding information, such as the transaction limit, discussed below, and one or more Personal Identification Numbers (PINS).

In accordance with the subject invention, a means for entering data into the storage means must be provided. One suitable data entry means, illustrated in the drawings, includes a plurality of electrical contacts 28. The electrical contacts 28 are intended to allow the card to interface with a transaction terminal located at a merchant. The contacts 28 can be used to both transmit and receive data and can also provide an independent power source for the operation of the smart card. At the present time, uniform standards are still being developed for electrical interfaces for smart cards. One suitable design can be found in U.S. Patent Number 4,222,516 to Badet.

The hardware described above, modified in a manner discussed below, is sufficient to carry out the objects of the subject invention. In this configuration, the card could be operated only when connected to a transaction terminal. However, it is desirable that the card be capable of performing the authorization procedure independent of a transaction terminal.

In order to operate independently, a human operable data entry means must be provided. In the illustrated embodiment, the data input means is shown as a key pad 40. The key pad 40 is connected to the random access memory 24 through line 42 which is typically a plurality of strobe lines. The key pad includes a number of keys which allow the cardholder to select accounts, enter transaction amounts and scroll through displayed prompts, as discussed later in detail with regard to the operation of the card.

Where the card is intended to operate independently of a terminal, it would also be desirable to provide a means for displaying human readable output. In this case, the means is defined by an LCD display 50 driven by the microprocessor 20.

A means for powering the card independent of the terminal should also be provided. This requirement is satisfied in the subject invention through a battery 60. This battery may be recharged any time that the transaction card is used in conjunction with a transaction terminal. A panel of solar cells 62 can be provided as an alternative source of energy. The solar cells 62 would be connected to a charger 64 which, in turn, is connected to the battery 60.

The card described above can be used to carry out the transactions in a manner similar to smart cards known in the prior art. For further information on smart cards see U.S. Patents 3,971,916 to Moreno; No. 4,001,550 to Schatz; No. 4,007,355 to Moreno; No. 4,092,524 to Moreno; No. 4,102,493 to Moreno; No. 4,211,919 to Ugon; No. 4,256,955 to Giraud; No. 4,295,041 to Ugon; No. 4,417,413 to Hoppe; No. 4,443,049 to De Pommery and No. 4,447,716 to Aigo.

In the illustrated embodiment, a transaction is initiated by pressing a key corresponding to the account which will be involved. The card can contain information regarding one or more accounts as indicated by keys 40A, B and C. Once the account is selected, a secret password or personal identification number (PIN) must then be entered in order to continue the transaction. The amount of the transaction would then be entered through the numeric keys on the key pad 40. The microprocessor will then evaluate the transaction for approval. If an approval can be given, an authorization code will be generated and shown on the display 50.

Similar steps would be carried out if the card were connected to a local terminal. In this case, data would flow through contacts 28. The transaction amount could be entered into the key pad of the transaction terminal and then supplied to the card via contacts 28. The microprocessor in the card would then evaluate the transaction and generate either an approval or a denial which could be transmitted back to the terminal through contacts 28.

The authorization decision is made by the microprocessor by comparing the entered transaction amount with a transaction limit for the selected account stored in the card. The transaction limit is set by the issuer and can take a number of forms.

Where the account is for checking, savings or other similar types of accounts, the transaction limit will typically represent the amount which the customer has on deposit with the issuer. If the transaction amount does not exceed the stored transaction limit, the transaction can be approved. After the transaction is approved, the transaction limit is debited by the amount of the transaction such that the transaction limit represents a declining balance for that account.

The transaction limit can also be a fixed dollar level based upon the credit worthiness of the customer. For example, a certain customer may be assigned a transaction limit of $200. In this case, the card could approve any purchase which does not exceed $200. If the purchase exceeded $200, a more in depth analysis of the cardholder would be made by linking the card to the on-line approval network.

In the transaction procedures described above, the microprocessor must compare the stored transaction limit with the transaction amount. This comparison is only possible where the two values are in the same currency. If the cardholder travels to a foreign country where the transaction amount is expressed in currency different from the local or base currency of the issuer, off-line approval would be impossible. This drawback is overcome in the subject invention as described in detail below.

Briefly, the subject transaction card is provided with one or more rates for converting the base currency into different foreign currencies. The cardholder can then select the desired currency from the data input means. The microprocessor converts the transaction limit from the base currency to the selected foreign currency. Thereafter, when the transaction amount is entered, it can be directly compared with the converted transaction limit to permit the generation of an approval code.

Figures 3 through 5 illustrate the operation of the device in greater detail. Figure 3 illustrates the steps carried out to enter the currency conversion rates into the card. As can be appreciated, because of the volatile nature of currency conversion rates, it would not be practical to issue a card with a fixed conversion rate. Therefore, it is envisioned that conversion rates will be entered into the card as needed. The conversion rates will be operable for a fixed period of time.

It should be noted that the currency conversion rate does not have to be exact since it is not being used to reconcile the transaction. Stated differently, the rate is not used as the basis to transfer funds from the cardholder to the merchant. Rather, the rate is merely used to determine whether that particular cardholder should be authorized to complete the transaction. The evaluation of any cardholder is not particularly exact, and is based upon prior performance and statistical analysis. Thus, the transaction limit set by the bank is, to some extent, arbitrary. Thus, there is no need to insure that the conversion to a different currency is exact. Indeed, the card could be loaded with a conversion rate, intentionally weighted in favor of the issuer to reduce potential losses.

The first step in loading a conversion rate into the device requires the establishment of contact with the issuer as shown in block 102 in Figure 3. Where the card has been placed in a transaction terminal, such as, for example, an automatic teller machine (ATM), this link will be established via communication lines. If the transaction card itself is provided with human operable input and output means as shown in Figures 1 and 2, the link with the issuer could be established in person or through a normal telephone. In either case, the issuer must be supplied with the cardholder's name, the account number, the countries to which the cardholder, will be travelling and the travel dates as shown in block 104.

Once supplied with this information, the issuer carries out the steps illustrated in block 106. The first step is to validate the identity of the cardholder based on the transmitted account number. The issuer will then generate a conversion rate and an associated expiration date. As noted above, the conversion rate does not have to be exact. The issuer will typically calculate a favorable rate which is unlikely to be reached in the given time period. If the time period stated by the cardholder is very long, an interim conversion rate can be generated and the cardholder would be requested to recontact the issuer for an update when the conversion rate expires.

The conversion rate and the expiration date are then transmitted to the cardholder. In the preferred embodiment, some or all of this information is encrypted prior to transmission. The encryption scheme will be based on the account number and is designed to prevent a cardholder from entering a fraudulent rate. Where the card is being operated independently of a transaction terminal, the cardholder will enter the encrypted data corresponding to the conversion rate and the expiration date through the key pad 40. If the card is connected to a transaction terminal for this procedure, the transfer of data will take place automatically through contacts 28. In either case, conversion rates will be generated and supplied for each of the foreign currencies which are expected to be encountered. Once the loading of the conversion rates is complete, no further contact with the issuer is necessary.

Turning to Figure 4, a flow diagram is provided illustrating the steps the cardholder takes upon entering a country where the currency is different

than the base currency of the issuer. As noted above, in existing cards, a transaction limit in the base currency (for example, dollars) will be stored in the memory 30 of the card. This transaction limit may be of the type which will be debited upon each purchase. In any case, in order to successfully use the card in a foreign country, the cardholder must initiate a sequence for converting the stored transaction limit to the foreign currency.

The first step in this procedure requires the cardholder to select the account which he intends to use. It should be noted that the transaction limit will most likely be different for each different account, particularly in a situation where debiting of the transaction limit takes place after each purchase. However, only one conversion rate per currency is necessary for each card. The account is selected by pressing one of keys 40A through 40C.

When an account has been selected in step 202, the microprocessor asks the cardholder provide an unambiguous input of his identity. The most common form for this identification is through the use of a Personal Identification Number (PIN). The PIN is typically a multidigit number known only to the cardholder. The PIN is stored in a read only memory in the card and is compared with a number entered by the cardholder at the time of the transaction. The use of a PIN prevents someone from utilizing a lost or stolen card. Preferably, a different PIN number is used for each account. In the preferred embodiment, the transaction card stores the PIN in encrypted form and the card includes an algorithm to permit the cardholder to change his PIN.

After the PIN has been entered and approved (block 204), the cardholder then selects the desired currency as shown in block 206. In the preferred embodiment, this step is performed in two parts through a scrolling technique. More particulary, after the PIN has been approved, one of a number of possible functions will be shown on the display means. These functions will include "MAKE A PURCHASE", "SEE AMOUNT AVAILABLE", "ADD TO ACCOUNT", "SELECT CURRENCY" etc. The particular prompt on the LCD display can be changed by pressing either the NEXT or BACK keys 40D and E, respectively. When the desired function is displayed, the YES key 40F is pressed. In this case, when the phrase "SELECT CURRENCY" is displayed, the YES key 40F is pressed, causing one of a list of currencies to be displayed.

The currencies which would be displayed could include dollars, yens, francs, pounds, pesos, etc. Once again, the display can be scrolled using the NEXT and BACK keys 40D, E. The desired currency is then selected using the YES button 40F. When this step has been completed, the microprocessor will then convert the transaction limit for the selected account from the base currency to the selected currency, using the associated conversion rate. During this process, the microprocessor will check to see that the expiration date associated with the current conversion rate is still in the future. This comparison requires that microprocessor include a calender function. If the expiration date has passed, the conversion will not take place.

The cardholder may verify that the conversion has occurred by selecting from the menu the prompt "SEE AMOUNT AVAILABLE" (block 208). If the conversion has taken place, the transaction limit will be displayed in the selected currency.

The currency can be changed again by the cardholder by the same process. In order to minimize the number of conversion rates stored in the card, the transaction limit should not be converted directly from one foreign currency to another foreign currency. Rather, the microprocessor should first convert the selected foreign currency back to the base currency using the associated conversion rate and thereafter convert the base currency into the newly selected currency using the conversion rate associated with the newly selected currency. The cardholder can select the desired currency just prior to a purchase, however, it may be easier to select the currency at the time when the cardholder enters the foreign country. No further change is necessary until the cardholder leaves the country.

Figure 5 illustrates the steps carried out when a purchase is to be made in a foreign currency after the transaction limit in the card has been converted to that selected currency. As in the previous flow chart, the customer will first select the account to be used (block 302) by depressing any of the buttons 4A through C. The cardholder is then prompted with the request to enter his PIN (block 304). Assuming the PIN has been entered and approved, the available options can then be observed by scrolling through the list using the NEXT and BACK keys 40D and E. When "MAKE A PURCHASE" is displayed, the user will press the YES button 40F as indicated by block 306. When this option has been selected, the user will be prompted by the display to enter the transaction amount. The cardholder enters the amount of the purchase in the selected currency using the numeric keys of pad 40 as indicated in block 308.

Once the transaction amount has been entered, the microprocessor will compare that amount to the transaction limit expressed in the foreign currency. If the transaction amount exceeds the transaction limit, no authorization will be generated and the transaction will be denied as shown in block 312. If, however, the transaction amount does not exceed the transaction limit, the microprocessor will generate an approval code, as shown in step 314.

In the illustrated embodiment, the approval

code will be shown on the display 50, as indicated in block 316. The displayed approval code is then entered into the sales draft by the merchant for future reference. For example, the presence of a proper approval code will generally free the merchant from liability from accepting a lost or stolen card. If the card is connected to a transaction terminal, the approval code might be shown on a display at the terminal or automatically imprinted directly on the sales draft.

Where the particular account accessed is in the nature of a debit account and, if the transaction has been approved, the transaction limit will be debited by the amount of the transaction (block 318). When the funds in the account have been exhausted, the cardholder must request an additional amount from the issuer. This request procedure is performed in a manner analogous to the input of the conversion rates discussed above.

In summary, there has been provided a new and improved transaction card which can be utilized to authorize transactions in a foreign currency. This object is achieved by providing a means for converting a stored transaction limit to a selected currency. When the transaction amount is entered in the selected currency it can then be compared to the converted transaction limit to allow the authorization process to proceed.

Claims

1. A transaction card for authorizing a transaction in foreign currencies comprising:
    data entry means (28, 40);
    storage means (24) for holding a transaction limit represented in a base currency and at least one rate for converting the base currency to a different, foreign currency; and
    processor means (20) connected to the data entry means (28, 40) and the storage means (24) and functioning such that when a transaction is to be carried out in a foreign currency said processor means (20) will convert the transaction limit represented in the base currency into a transaction limit represented in foreign currency using the associated conversion rate and thereafter compare the transaction amount expressed in the foreign currency supplied through said data entry means (28, 40) to said converted transaction limit to determine if the transaction should be approved.

2. A transaction card according to claim 1, characterised in that said processor means (20) generates an approval code if the transaction amount does not exceed the transaction limit.

3. A transaction card according to claim 2, characterised by display means (50).

4. A transaction card according to claim 3, characterised in that after said approval code is generated it is displayed on said display means (50).

5. A transaction card according to claim 3, characterised in that said transaction amount is shown on said display means (50) after it has been entered.

6. A transaction card according to claim 1, characterised in that if said transaction is approved, said processor means (20) debits the transaction limit by the transaction amount.

7. A transaction card according to claim 1, characterised in that said processor means (20) converts the transaction limit from one foreign currency to another by first converting said transaction limit into said base currency and thereafter into another foreign currency using the appropriate currency conversion rates.

8. A transaction card according to claim 1, characterised in that an expiration date is stored in conjunction with each said conversion rate and in that said processor means (20) compares the expiration date with the current date to determine if the transaction should be authorized.

9. A transaction card according to claim 1, characterised in that the foreign currency is selected through said data entry means (28, 40).

10. A transaction card according to claim 1, characterised in that said data entry means is defined by electrical contacts (28).

11. A transaction card according to claim 1, characterised in that said data entry means is defined by a key pad (40).

Patentansprüche

1. Geschäftskarte zum Genehmigen eines Geschäfts in Fremdwährungen, mit:
    einer Dateneingabeeinrichtung (28, 40);
    einer Speichereinrichtung (24) zum Aufnehmen eines Geschäftslimits, das in einer Basiswährung dargestellt ist, und wenigstens eines Kurses zum Umrechnen der Basiswährung in eine andere, fremde Währung; und

einer Prozessoreinrichtung (20), die mit der Dateneingabeeinrichtung (28, 40) und der Speichereinrichtung (24) verbunden ist und so funktioniert, daß, wenn ein Geschäft in einer Fremdwährung auszuführen ist, die Prozessoreinrichtung (20) das Geschäftslimit, das in der Basiswährung dargestellt wird, in ein Geschäftslimit, das in der Fremdwährung dargestellt wird, unter Verwendung des zugeordneten Umrechnungskurses umrechenen und anschließend den in der Fremdwährung ausgedrückten Geschäftsbetrag, der über die Dateneingabeeinrichtung (28, 40) eingegeben wird, mit dem umgerechneten Geschäftslimit vergleichen wird, um festzustellen, ob das Geschäft genehmigt werden sollte.

2. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß die Prozessoreinrichtung (20) einen Genehmigungscode erzeugt, wenn der Geschäftsbetrag das Geschäftslimit nicht übersteigt.

3. Geschäftskarte nach Anspruch 2, gekennzeichnet durch ein Anzeigeeinrichtung (50).

4. Geschäftskarte nach Anspruch 3, dadurch gekennzeichnet, daß, nachdem der Genehmigungscode erzeugt worden ist, er auf der Anzeigeeinrichtung (50) angezeigt wird.

5. Geschäftskarte nach Anspruch 3, dadurch gekennzeichnet, daß der Geschäftsbetrag auf der Anzeigeeinrichtung (50) angezeigt wird, nachdem er eingegeben worden ist.

6. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß, wenn das Geschäft genehmigt ist, die Prozessoreinrichtung (20) das Geschäftslimit mit dem Geschäftsbetrag belastet.

7. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß die Prozessoreinrichtung (20) das Geschäftslimit aus einer Fremdwährung in eine andere umrechnet, indem sie zuerst das Geschäftslimit in die Basiswährung und anschließend in eine andere Fremdwährung unter Verwendung der geeigneten Währungsumrechnungskurse umrechnet.

8. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß ein Ablaufdatum in Verbindung mit jedem der Umrechnungskurse gespeichert wird und daß die Prozessoreinrichtung (20) das Ablaufdatum mit dem laufenden Datum vergleicht, um festzustellen, ob das Geschäft genehmigt werden sollte.

9. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß die Fremdwährung über die Dateneingabeeinrichtung (28, 40) ausgewählt wird.

10. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß die Dateneingabeeinrichtung durch elektrische Kontakte (28) gebildet ist.

11. Geschäftskarte nach Anspruch 1, dadurch gekennzeichnet, daß die Dateneingabeeinrichtung durch eine Tastatur (40) gebildet ist.

Revendications

1. Carte de transaction pour autoriser une transaction dans des monnaies étrangères comprenant :
   - des moyens d'entrée de données (28, 40);
   - un moyen de stockage (24) pour le maintien d'une limite de transaction représentée par une monnaie de base et au moins un taux de conversion de la monnaie de base en une monnaie étrangère différente et
   - un moyen de processeur (20) raccordé aux moyens d'entrée de données (28, 40) et aux moyens de stockage (24) et fonctionnant de telle façon que lorsqu'une transaction doit être réalisée en une monnaie étrangère, ledit moyen de processeur (20) convertisse la limite de transaction représentée par la monnaie de base en une limite de transaction représentée par la monnaie étrangère à l'aide du taux de conversion associé puis compare le montant de la transaction exprimé dans la monnaie étrangère fournie via lesdits moyens d'entrée de données (28, 40) à ladite limite de transaction convertie pour déterminer si la transaction doit être acceptée.

2. Carte de transaction selon la revendication 1, caractérisée en ce que ledit moyen de processeur (20) génère un code d'acceptation si le montant de la transaction n'excède pas la limite de transaction.

3. Carte de transaction selon la revendication 2, caractérisée par un moyen d'affichage (50).

4. Carte de transaction selon la revendication 3, caractérisée en ce que, après la génération dudit code d'acceptation, il est affiché sur ledit moyen d'affichage (50).

5. Carte de transaction selon la revendication 3, caractérisée en ce que ladite quantité de transaction est visualisée sur ledit moyen d'affichage (50) après son entrée.

6. Carte de transaction selon la revendication 1, caractérisée en ce que, si ladite transaction est acceptée, ledit moyen de processeur (20) débite la limite de transaction de la quantité de la transaction.

7. Carte de transaction selon la revendication 1, caractérisé en ce que ledit moyen de processeur (20) convertit la limite de transaction d'une monnaie étrangère en une autre par une première conversion de ladite limite de transaction en ladite monnaie de base puis en une autre monnaie étrangère à l'aide des taux appropriés de change de monnaie.

8. Carte de transaction selon la revendication 1, caractérisée en ce qu'une date d'expiration est stockée en conjonction avec chacun desdits taux de conversion et en ce que ledit moyen de processeur (20) compare la date d'expiration avec la date courante pour déterminer si la transaction doit être acceptée.

9. Carte de transaction selon la revendication 1, caractérisée en ce que la monnaie étrangère est choisie via lesdits moyens d'entrée de données (28, 40).

10. Carte de transaction selon la revendication 1, caractérisée en ce que lesdits moyens d'entrée de données sont définis par des contacts électriques (28).

11. Carte de transaction selon la revendication 1, caractérisée en ce que lesdits moyens d'entrée de données sont définis par un pavé numérique (40).

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FIG-1-

FIG.2.

ESTABLISH CONTACT
WITH ISSUER — 102

SUPPLY CARDHOLDER
NAME, ACCOUNT NUMBER,
DESTINATIONS, TRAVEL DATES — 104

ISSUER — 106

VALIDATES CARDHOLDER
IDENTITY

GENERATES CONVERSION
RATE AND EXPIRATION DATE

ENCRYPTS DATA

TRANSMITS DATA TO
CARDHOLDER

DATA ENTERED AND
STORED IN CARD — 108

FIG.3.

SELECT ACCOUNT — 302

ENTER PIN — 304

SELECT "MAKE A PURCHASE" — 306

ENTER TRANSACTION AMOUNT — 308

COMPARE TRANSACTION AMOUNT WITH TRANSACTION LIMIT — 310

APPROVE TRANSACTION — 314

DISPLAY APPROVAL CODE — 316

DEBIT TRANSACTION LIMIT — 318

DENY TRANSACTION — 312

FIG. 5.

SELECT ACCOUNT — 202

ENTER PIN — 204

SELECT "SELECT CURRENCY" — 206

SELECT "SEE AMOUNT AVAILABLE" — 208

FIG. 4.

PCT

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(54) Title: A METHOD AND APPARATUS FOR DISBRIBUTING CURRENCY

(57) Abstract

A magnetic stripe card (10) with an encoded card number including a bank identification number (14) and an account number (16) is issued to a customer with a value selectable by the customer. The central card processor (66) establishes a zero balance database including the card numbers (17), but with blank fields for the customer data and the value of the account (78). When a customer purchases a card, the sales agent (40) transmits to the central database computer (45) which fills in the blanks in the database (46), activating the account, and transmits an acknowledgement. The card can be immediately used in ATM (50) or other remote terminals to acquire cash or purchase goods and services. The customer inputs a PIN number which is provided with the card, or an alternative PIN number selected by the customer.

A METHOD AND APPARATUS FOR DISTRIBUTING CURRENCY

5   BACKGROUND OF THE INVENTION
            The present invention relates to systems and
processes for dispensing currency to a cardholder in response
to an authorization over an electronic data network.
            A variety of cards are available to enable a
10   customer to electronically interface with a financial
institution. Credit cards are a well-known example of this,
plastic cards having a magnetic stripe with an encoded account
number. These cards can be read by special terminals at a
merchant's site, commonly referred to as point-of-sale (POS)
15   terminals. The account number can then be transmitted over a
network, such as the VisaNet network. In addition to the
account number, the amount of the transaction is also
transmitted for authorization. A remote main-frame computer
checks a database to determine if the credit card customer is
20   still within his/her credit limit, before authorizing the
purchase.
            Another type of card is a debit card, which is not
used to extend credit, but rather to withdraw cash or pay a
merchant immediately. The amount of the transaction is
25   deducted from the customer's checking account, which the
customer can periodically replenish. Here, the customer must
have the money in the account before the transaction is
approved, rather than having to pay the money on credit
extended, as for a standard credit card.
30   Another type of card is an automated teller machine
(ATM) card. These are typically issued by a particular
financial institution or bank, allowing a customer to access
the customer's checking or savings account for withdrawal from
a remote ATM. The remote ATM is connected through an ATM
35   interchange to various banks subscribing to a particular ATM
network. Like a debit card, this card causes an immediate
deduction from the customer's account. The immediate
deduction is actually a same day or same night deduction,

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since the amount of the transaction is typically recorded, and
then actually processed in batch mode at night with other
transactions. One danger of the ATM system is that of a lost
or stolen card. The use of a Personal Identification Number
5   (PIN), known only to the customer, eliminates much of the
risk. Another control is imposing a daily limit, $200, for
instance, on any withdrawals by a particular card during any
day.

       Other types of cards store the account amount
10   directly on the card. An example would be a transit card,
such as cards for the Bay Area Rapid Transit (BART) District.
When these cards are purchased, the dollar amount of the card
is magnetically recorded on the card. Each time the card is
used by passing it through an access terminal, the fare is
15   deducted from the amount on the card, and a new card value is
magnetically recorded on the card itself. An advantage of
such a card is that if it is lost or stolen, the potential
loss value is only the amount recorded on the card itself. A
disadvantage is that there is no ability to contact the issuer
20   and freeze the remaining account balance.

       Other than these different types of cards, and
currency itself, there is yet another device for obtaining
cash which is very popular. That is the paper travellers
cheque. Travellers cheques are desirable as compared to
25   currency because of the signature authorization required and
the ability to report them as stolen or lost and identify them
by serial number. In addition, they are issued in limited
amounts, and thus may limit the possible exposure. Unlike
debit cards or credit cards or even ATM cards, there is no
30   account number which can easily be verified online to see if
the account has been closed.

                    SUMMARY OF THE INVENTION
       The present invention provides an electronic cash
35   access process which includes a unique combination of aspects
of both debit cards and travellers cheques, referred to herein
as an Electronic Travellers Cheque (ETC). The process can
also be used for money transfer and any other pre-paid cash

access product. A card is issued to a customer with a value
selected by the customer. Unlike a credit or debit card, the
value is fixed. Unlike a transit card, the amount of the
value of the card is stored in a central computer. The card

5 can be used to access the account through an ATM or other
terminals world-wide, with the use of a personal
identification number (PIN) to provide added security greater
than that, for instance, given by the signature on a
traditional paper travellers cheque. The card is disposable

10 when the account is depleted, with a new card and account
required for a new amount of cash.

The cards themselves have a magnetic stripe with an
encoded card number including a bank identification number
(BIN) and an account number. The cards may be issued by

15 multiple ETC issuers who have financial responsibility for the
accounts, but are processed on their behalf by a single entity
referred to as the ETC processor herein. The ETC processor
establishes a zero balance database including the card
numbers, but with blank fields for the customer data (name,

20 address, etc.) and the value of the card. The cards are
provided to a bank or other sales agent. When a customer
purchases a card, the sales agent uses local software to
remotely transmit to the central database the card number (or
a serial number) along with the customer data and the amount

25 purchased. The software at the ETC processor fills in the
blanks in the database, activating the account, and transmits
an acknowledgement signal back to the sales agent software.

The customer can immediately use the card in ATM or
other remote terminals to acquire cash or purchase goods or

30 services. The customer inputs a PIN number which is provided
with the card, or a customer selected alternative PIN number.
The transaction is handled by the ATM or other terminal in
much the same manner as a normal ATM transaction using an ATM
card.

35 When the cards are manufactured, they preferably
have a serial number printed on them which is different from
the card number recorded on a magnetic stripe on the card.
The sales agent would actually preferably transmit the serial

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number over the data link to the ETC processor for added
security. In addition, the agent will transmit an agent
identification number. The ETC processor verifies that the
agent is authorized to sell a particular serial number, and
5   translates the serial number into the appropriate card number,
including the BIN number and account number. The remote
computer can then determine a location in the database to be
loaded with the account information.

The BIN number of the issuing institution is stored
10   in the database in the ETC processor along with an indication
of the currency used for issuance. A particular bank may have
multiple BIN numbers for multiple types of currencies in which
cards can be issued. When a customer uses the card in a
remote terminal, that terminal may be connected to an
15   intermediate network, such as the VisaNet network. The
currency of the terminal is transmitted to the central VisaNet
computer, and the central VisaNet computer does a currency
conversion, if necessary, to debit the account balance.

The serial number provides an additional level of
20   security. The sales agent can transmit the serial number,
making it more difficult for someone to intercept the message
and determine the account number. Also, a customer can select
or change the PIN from any touch tone phone by using the
serial number printed on the card. In addition, the central
25   database has fields for storing status information indicating
that certain serial number cards have been ordered from the
manufacturer, shipped to the sales agent, and received by the
sales agent. This information can be accessed by standard
inventory software to track it and keep it current for
30   security to insure an agent is authorized to sell a particular
serial number card.

For a fuller understanding of the nature and
advantages of the invention, reference should be made to the
ensuing detailed description taken in conjunction with the
35   accompanying drawings.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram of an ETC card according to the present invention;

Fig. 2 is a diagram illustrating the production of the card of Fig. 1;

Fig. 3 is a simplified block diagram illustrating the issuance and use of the electronic travellers cheque (ETC) of the present invention;

Fig. 4 is a block diagram of the data network used by the present invention;

Fig. 5 is a flowchart illustrating the program steps for issuance and activation of an ETC;

Fig. 6 is a flowchart illustrating a software program for controlling the usage of an ETC;

Fig. 7 is a flowchart illustrating a software program for controlling replacement card issuance; and

Fig. 8 is a flowchart illustrating a program for assigning a replacement PIN.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 is a diagram of an ETC card 10 according to the present invention. The card has a magnetic stripe 12 on it, including the account information. The magnetic stripe has encoded on it first a bank identification number (BIN) 14. This number not only defines the issuing bank, but also the currency in which the card was issued. If a bank issues only in U.S. currency, it might have just a single number, while a bank which issues in multiple currencies might have multiple BIN numbers assigned. A second number is the actual account number 16 for the particular card. The BIN and account number form a card number 17, sometimes also referred to as a Primary Account Number (PAN). A third number is a service code number 18 which identifies to the appropriate software that this is a "cash only" use card. An alternate service code could be used for authorizing the card for debits for a purchase at a merchant's site in a point of sale (POS) device. Finally, a Card Verification Value (CVV) 19 is used for error detection and fraud detection.

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The card also includes a serial number 20 printed on
the face of the card to be visible to a sales agent. The
serial number can be related by the computer to the encoded
account number, which is not itself visible. Finally, a memo
5   pad 22 is included on the card, with multiple lines for a
customer to write on to indicate the current balance on the
card. As each withdrawal is made with the card, the customer
can indicate the remaining balance by subtracting the amount
withdrawn from the previous balance and writing it on the
10   card. The card is not embossed to prevent its use as a credit
or debit card. Fraud possibilities are thus limited because
it cannot be used to produce imprints like a credit card or
debit card. There is no need for an expiration date as for a
credit card since there is no need for credit controls because
15   the money has already been received by the issuer. However,
an expiration date (which may be a long time in the future)
may be encoded on the magnetic stripe so it will be compatible
with ATM and other terminals that expect to see an expiration
date to accept a card.
20   Fig. 2 is a diagram illustrating the actual creation
of the cards. A series of blank cards 26 are provided to card
personalizing machinery 28. Machinery 28 encodes on the
magnetic stripe on the card the card number (the BIN number
and the account number), the service code and the CVV number.
25   In addition, the serial number is printed on the card, with
the finalized card 10 coming out of the output of the machine.
At the same time, a printed envelope or jacket 30 is produced
from a printer 32. The envelope 30 will include in it a
personal identification number (PIN). The card is placed in
30   its corresponding envelope to produce a combined media and pin
jacket 34. A record of the BIN, account and other numbers is
stored in an issuer record database 36. A number of card
packages 34 can be provided for the inventory of a particular
sales agent for sales to end customers.
35   Fig. 3 is a diagram illustrating the activation and
use of the ETC cards at a broad level. A sales agent 40 has a
stack of packaged cards 34 in inventory. A customer 42 can
approach the sales agent, indicating the customer's name and

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other identifying information, along with the amount of value
desired. The sales agent selects an ETC card and enters its
serial number into a terminal (which could be a telephone) 44,
along with the customer data and amount. The terminal then
5   transmits this information via communications link 43 to a
network such as the VisaNet network 51 (as used herein,
VisaNet network refers to the combination of the hardware,
software and other elements which comprise the network). The
sales agent will also transmit a sales agent code and
10   password. The sales agent code will identify the agent or
financial institution. If the sales agent is authorized to
issue multiple currencies, a code for the appropriate currency
desired by the customer is used.

A database 46 in a main-frame computer 45 looks up
15   the BIN and then the account number for that serial number in
a database 46. The database will include blanks for the
customer data and amount next to each account number, which
will be filled in by the information provided. The computer
will then send an acknowledgement message back to the sales
20   agent, who will print a receipt for the customer and complete
the transaction.

The customer can then go to any Visa ATM 50 to use
the card. ATM 50 is connected to the VisaNet network via
communications link 52. The data transmitted by the ATM
25   includes the card number and the amount of the currency the
customer wishes to withdraw. This currency amount is compared
to the amount stored in the database for that card number. If
sufficient value is authorized, the withdrawal is authorized
by return message. The VisaNet computer provides any currency
30   conversion needed, since the ATM will transmit a code
indicating the currency it dispenses and the database will
know the currency of the card from the BIN number for that
card number stored in its database.

The account number for the ETC card is not an
35   account of the sales agent or bank. Instead, it is an account
maintained with the ETC issuer. Thus, no preexisting account
relationship with the bank or sales agent is required. In
addition, the issuing procedure for the ETC card results in

instant activation of the account and the card. The customer
can literally walk to a Visa ATM outside the bank issuing the
card and use the ETC card immediately.

     Fig. 4 is a more detailed block diagram of an
5   electronic network used by the present invention. A first
sales terminal 60 is shown connected through an interface 62
to a communication line, such as a digital T-1 line 64 to an
ETC processor 66. A second sales terminal 68 at a separate
bank or sales agent is connected through a dial-up modem 70 to
10   a public packet-switched network communication link 72 to ETC
processor 66. The ETC processor includes a computer 74
connected to an inventory database 76, an account database 78,
and an agent database 80. The account database 78 stores the
account information which is updated each time a customer uses
15   the ETC card.

     ETC processor 66 is connected to a network, such as
VisaNet network 82. VisaNet network 82 includes a central
computer with a communication processor 84, such as an IBM
3745. The communication processor 84 is connected to a main-
20   frame 86, such as an IBM 3090. A memory 88 provides storage
for main-frame 86. A control terminal 90 allows for local
servicing and control.

     Communication processor 84 is connected to an ATM
interchange 92, which in turn is connected to individual ATM
25   machines 94. In addition, the communication processor 84 may
be connected to a direct-debit network 96, which is connected
to individual point-of-sale (POS) terminals 98.

     In operation, when a card is used at an ATM 94, a
message is passed through ATM interchange 92 to VisaNet
30   network 82. The VisaNet network determines the destination,
then forwards the message to the ETC processor for
authorization and debiting of the account balance. The return
message is passed from ETC processor 66, through VisaNet
network 82 and ATM interchange 92 to the individual ATM
35   machine 94, which can now dispense cash to the customer.

     Another VisaNet service is stand-in processing
(STIP) software 100, typically used when a connected processor
is not available. This STIP software includes positive

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cardholder authorization service (PCAS) software which can do
card number verification, PIN verification, and balance
verification, if desired.

Fig. 5 is a flowchart illustrating the operation of
the software at the sales agent's terminal in conjunction with
the software at the ETC processor. The sales agent first
inputs an agent number and an agent password (step A). Next,
the card serial number is input (step B). The customer data
and the currency amount are also input (steps C and D).
Finally, the customer may optionally select a PIN number other
than the one preassigned, if the sales agent has this
capability (step E). Alternately, the customer may change the
PIN at a touch-tone phone as shown in Fig. 8, discussed below.
This information is then transmitted to the ETC processor via
the datalink (step F).

The software at the ETC processor, upon receiving
the transmitted data, first validates the agent number and
password by comparing it to the database 80, shown in Fig. 4,
of authorized agents and passwords (step G). A translation
table is then consulted to determine the card number from the
serial number (step H). The card number is used to find the
appropriate BIN and account number records in the database
(step I).

The account database is consulted, looking up the
entries corresponding to that issuer BIN (step J). Once that
sector of the database is located, the particular account
number is located (step K). The inventory status data stored
with the account number is checked to determine if the serial
number received was distributed to that sales agent. The
customer data and currency amount is then entered into the
blank fields corresponding to that account number in the
database (step L). The account number and the PIN number
stored in the database (or a new PIN number transmitted by the
customer) are then transmitted to the VisaNet system for
updating of the PCAS software (step M). Finally, an
acknowledgement message is sent back to the sales agent (step
N).

10

   The software at the ETC processor also calculates an
agent commission, if any (step O). This is stored in the
database, with a settlement routine (step P) being run at the
end of the day. Finally, back at the agent terminal, the
5   agent terminal software, upon receipt of the acknowledgement
message from the ETC processor, prints a customer receipt
(step Q).

   The use of a serial number separate from the card
number allows a customer to securely use a touch-tone phone to
10   change a PIN by transmitting the identifying serial number.
A customer can access customer service software through a
touch-tone phone for this purpose. The customer could also be
required to transmit other customer data, to enable a check of
the database to confirm that customer data is associated with
15   that serial number or corresponding card number.

   The status data maintained in the account database
allows additional security for card inventory. In one
embodiment, a first status field is used to indicate when the
issuer has placed an order with the card manufacturer to
20   create more cards. A second status field indicates an
acknowledgement from the card manufacturer that the cards have
been made and shipped to a particular sales agent. A third
status field is used to indicate an acknowledgement from that
sales agent of receipt of the cards. Thus, a multiple point
25   check is built into the database. Using the account database
to store this inventory information also allows simple
inventory software to be used, and integrates the inventory
security requirements (unique to this type of a card) with the
rest of the system.

30   .   Fig. 6 is a flowchart illustrating the software used
when a customer actually uses the card after issuance. The
customer can insert the card into a standard Visa ATM machine
(alternately, a POS or other device may be used). The ATM
machine software causes the magnetic stripe to be read and
35   determines the card number, including the BIN number and
account number from the card (step A). The customer then
inputs the PIN number, which the software also captures (step

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B). Finally, the customer inputs the desired debit amount to be withdrawn (step B).

The local ATM software then transmits a message to the VisaNet system with the input information (step C). The ATM also transmits a currency code which shows what currency is in the ATM. The VisaNet network performs any required currency translation (step D). The ETC processor software then looks up the card number in the database (step E), and the PIN number associated with the account in the database is compared to the transmitted PIN number (step F). If the PINs don't match, a return error message is transmitted to the ATM (step G).

If the numbers do match, the debit amount is then compared to the amount remaining in the account (step H). If there is insufficient funds, an error message is returned to the ATM indicating insufficient funds (step I). If sufficient funds are available, the software then updates the balance for that account after the debit (step J), and an authorization approval message is returned to the ATM (step K).

Fig. 7 illustrates a software routine used by a service center to issue a new card when a customer has lost the card. The service agent first inputs the customer name and other data along with a new account number corresponding to a new card, just as in the new card routine (step A). This is transmitted to the ETC processor, which then does a lookup of the account, matching the customer name and other data to verify ownership of the account. If the card number or card serial number are available, these can be used instead (step B). If there is no match, an error message is returned (step C).

If the customer name and other data matches to verify account ownership, the old account is closed (step D). The amount of the old balance is then transferred to the new account, along with the customer name and any other identifying information (step E). An acknowledgement message is then transmitted back to the service agent (step F). The other aspects of the card issuance set forth in Fig. 5 are also followed, with Fig. 7 setting out the new steps required

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for transfer from one account to another. As can be seen, a
lost card can thus have the account closed, rendering it
useless. This is an advantage over a paper travellers cheque,
which could be forged.

5   Fig. 8 illustrates the operation of the service
agent software for assigning a new PIN number where a customer
desires a new PIN or has forgotten the PIN number. The
service agent first inputs the customer name and any other
identifying data that is available, along with the desired new

10   PIN number (step A). The old PIN could also be required,
except for a lost PIN. This information is then transmitted
to the ETC processor computer (step B). The ETC processor
computer compares the account information to determine whether
there is sufficient information to claim that account (step

15   C). If there is insufficient or non-matching information, an
error message is returned (step D).

           Otherwise, the PIN number assigned to that account
is updated (step E). The new PIN number is also transmitted
to the PCAS issuer record database in the VisaNet system for

20   updating as well (step F). Finally, an acknowledgement
message is returned to the service agents software (step G).

           As will be understood by those familiar with the
art, the present invention may be embodied in other specific
forms without departing from the spirit or essential

25   characteristics thereof. Accordingly, the disclosure of the
preferred embodiment of the invention is intended to be
illustrative, but not limiting, of the scope of the invention
which is set forth in the following claims.

WHAT IS CLAIMED IS:

1. A method for distributing currency or purchasing
goods and services, comprising the following steps:
    generating a plurality of card numbers, each card
number including an account number and a bank
identification number, corresponding to card numbers
encoded on a plurality of cards;
    creating a database on a central computer having at
least a first field for said bank identification number,
a second field for said account number, a third field for
customer data, a fourth field for a currency amount, and
a fifth field for a personal identification number (PIN);
    loading said bank identification number and said
account numbers into said database, leaving said third
and fourth fields blank;
    receiving, at the time of card purchase, customer
data, an ID number corresponding to a card number and a
currency amount selected by a customer from a first
remote terminal;
    immediately entering said customer data and said
currency amount into said third and fourth fields,
respectively, of said database corresponding to a bank
identification number and an account number included in
said card number;
    immediately entering a personal identification
number (PIN) into a fifth field of said database
corresponding to said customer;
    subsequently receiving, from a second remote
terminal, a customer inputted PIN, a card number from a
card for said customer and a debit currency amount;
    subtracting said currency debit amount from the
currency amount in said database corresponding to the
received customer card number and PIN and updating said
currency amount in said database;
    transmitting to said second remote terminal an
authorization message for dispensing said currency debit

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amount to the customer if said currency debit amount is
not greater than said currency amount in the database;
        transmitting to said second remote terminal a
message denying the dispensing of currency if said
currency debit amount is greater than the currency amount
in the database.

        2. The method of claim 1 further comprising the
steps of:
        transmitting, from said second remote terminal, a
currency code indicating a currency type in said second
remote terminal;
        comparing said currency type to an issuance currency
of said card indicated by said bank identification
number; and
        converting said debit currency amount of said
currency type to said issuance currency.

        3. The method of claim 1 further comprising the
steps of:
        printing a serial number different from said card
number on each of said cards;
        transmitting said serial number as said ID number;
and
        converting said serial number into said card number.

        4. The method of claim 1 further comprising the
steps of:
        storing inventory control status information in said
database to indicate the status of said cards;
        receiving a sales agent ID with said ID number for
said card;
        comparing said sales agent ID with said inventory
control status information;
        returning an error message if said comparing step
does not produce a match.

5.   The method of claim 4 wherein said inventory control status information includes first data indicating the ordering of cards by an issuer, second data indicating the shipment of cards by a card manufacturer and third data indicating the receipt of cards by said sales agent.

6.   The method of claim 1 further comprising changing said PIN according to the steps of:

receiving a new PIN and said ID number;

locating a card number corresponding to said ID number in said database; and

replacing the PIN in said fifth field for said card number with said new PIN.

7.   A method for distributing currency or purchasing goods and services, comprising the following steps:

generating a plurality of card numbers, each card number including an account number and a bank identification number, corresponding to card numbers encoded on magnetic stripes on a plurality of cards;

printing a visible serial number, different from, but related to, said card number, on each of said cards;

creating a database on a central computer having at least a first field for said bank identification number, a second field for said account numbers, a third field for customer data, and a fourth field for a currency amount;

loading said bank identification number and said account numbers into said database, leaving said third and fourth fields blank;

storing inventory control status information in said database to indicate the status of said cards;

receiving customer data, the serial number and a currency amount from a first remote terminal;

receiving a sales agent ID with said serial number for said card;

immediately translating said serial number into a card number;

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immediately entering said customer data and said currency amounts into said third and fourth fields, respectively, of said database corresponding to a bank identification number and an account number included in said card number;

immediately entering a personal identification number (PIN) into a fifth field of said database corresponding to said customer;

comparing said sales agent ID with said inventory control status information;

returning an error message if said comparing step does not produce a match;

subsequently receiving, from a second remote terminal, a customer inputted PIN, a card number from a card for said customer and a debit currency amount;

subtracting said currency debit amount from the currency amount in said database corresponding to the received customer card number and PIN and updating said currency amount in said database;

transmitting to said second remote terminal an authorization message for dispensing said currency debit amount to the customer if said currency debit amount is less than said currency amount in the database; and

transmitting to said second remote terminal a message denying the dispensing of currency if said currency debit amount is greater than the currency amount in the database.

8. A system for distributing currency or purchasing goods and services, comprising:

means for generating a plurality of card numbers, each card number including an account number and a bank identification number, corresponding to card numbers encoded on a plurality of cards;

a database on a central computer having at least a first field for said bank identification number, a second field for said account numbers, a third field for customer data, and a fourth field for a currency amount,

said bank identification number and said account numbers
being loaded into said database, leaving said third and
fourth fields blank, and a fifth field for a personal
identification number (PIN);

a first remote terminal for transmitting customer
data, and ID number corresponding to a card number and a
currency amount;

means for entering said customer data and said
currency amounts into said third and fourth fields,
respectively, of said database corresponding to a bank
identification number and an account number included in
said card number and entering the PIN into said fifth
field of said database corresponding to said customer;

a second remote terminal for transmitting a customer
inputted PIN, a card number from a card for said customer
and a debit currency amount;

means for subtracting said currency debit amount
from the currency amount in said database corresponding
to the received customer card number and PIN and updating
said currency amount in said database;

means for transmitting to said second remote
terminal an authorization message for dispensing said
currency debit amount to the customer if said currency
debit amount is not greater than said currency amount in
the database;

means for transmitting to said second remote
terminal a message denying the dispensing of currency if
said currency debit amount is greater than the currency
amount in the database.

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FIG. 1.

FIG. 2.

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FIG. 3.

FIG. 4.

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ETC PROCESSOR SOFTWARE

SALES AGENT SOFTWARE

```
        ┌─────────────────┐
        │      START      │
        └─────────────────┘
                 │
                 ▼                                    ┌──────────────┐ G
        ┌─────────────────┐ A                         │   VALIDATE   │
        │     INPUT       │                           │ AGENT NO. AND│
        │   AGENT NO.     │                           │   PASSWORD   │
        │  AND PASSWORD   │                           └──────────────┘
        └─────────────────┘                                  │
                 │                                            ▼
                 ▼                                    ┌──────────────┐ H
        ┌─────────────────┐ B                         │   DETERMINE  │
        │   INPUT CARD    │                           │   CARD NO.   │
        │   SERIAL NO.    │                           │ FROM SER. NO.│
        └─────────────────┘                           └──────────────┘
                 │                                            │
                 ▼                                            ▼
        ┌─────────────────┐ C                         ┌──────────────┐ I
        │     INPUT       │                           │ LOOK-UP BIN AND│
        │   CUSTOMER      │                           │ ACCT. NO. FROM│
        │     NAME        │                           │   CARD NO.   │
        └─────────────────┘                           └──────────────┘
                 │                                            │
                 ▼                                            ▼
        ┌─────────────────┐ D                         ┌──────────────┐ J
        │     INPUT       │                           │    LOCATE    │
        │   CURRENCY      │                           │   BANK BIN   │
        │    AMOUNT       │                           │              │
        └─────────────────┘                           └──────────────┘
                 │                                            │
                 ▼                                            ▼
        ┌─────────────────┐ E                         ┌──────────────┐ K
        │   INPUT OPT.    │                           │    LOCATE    │
        │    PIN CHG.     │                           │   ACCT. NO   │
        └─────────────────┘                           │    ENTRY     │
                 │                                     └──────────────┘
                 ▼                                            │
        ┌─────────────────┐ F                                ▼
        │   TRANSMIT      │                           ┌──────────────┐ L
        │   TO  ETC       │                           │ INSERT NAME, │
        │   PROCESSOR     │                           │    AMOUNT    │
        └─────────────────┘                           └──────────────┘
                 │                                            │
                 └────────────────────┐                      ▼
                                      │              ┌──────────────┐ M
                                      │              │   TRANSMIT   │
                                      │              │  CARD NO., PIN│
                                      │              │    TO PCAS   │
                                      │              └──────────────┘
                                      │                      │
                                                             ▼
                                                     ┌──────────────┐ N
                                                     │   TRANSMIT   │
                                                     │ACKNOWLEDGEMENT│
                                                     └──────────────┘
```

```
   ┌──────────────┐ Q                    ┌──────────────┐ O
   │    PRINT     │                      │    AGENT     │
   │   RECEIPT    │                      │    CREDIT    │
   └──────────────┘                      └──────────────┘
                                                 │
                                                 ▼
                                         ┌──────────────┐ P
                                         │    AGENT     │
                                         │  SETTLEMENT  │
                                         │  END OF DAY  │
                                         └──────────────┘
```

FIG. 5.

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```
                    ┌─────────────┐
                    │    START    │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │  READ  BIN, │ ── A
                    │  ACCT. NO.  │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │  INPUT PIN, │ ── B
                    │  CURRENCY   │
                    │   AMOUNT    │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │  TRANSMIT   │ ── C
                    │  WITH ATM   │
                    │CURRENCY CODE│
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │  CURRENCY   │ ── D
                    │ TRANSLATION │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │   LOOK  UP  │ ── E
                    │  ACCT. NO.  │
                    └──────┬──────┘
                           │
                        ◇ F                    ┌──────────┐
                      ╱ PINS ╲  ── NO ──────►  │  RETURN  │ ── G
                      ╲ MATCH?╱                │   ERROR  │
                        ◇                      └──────────┘
                        │ YES
                        ◇ H                    ┌──────────┐
                     ╱ AMOUNT ╲ ── NO ──────►  │  RETURN  │ ── I
                     ╲ ≤ THAN  ╱               │  INSUFF. │
                      ╲BALANCE?╱               │   FUNDS  │
                        ◇                      └────┬─────┘
                        │ YES                       │
                    ┌──────▼──────┐                 │
                    │   UPDATE    │ ── J ◄──────────┘
                    │   BALANCE   │
                    └──────┬──────┘
                           │
                    ┌──────▼──────┐
                    │   RETURN    │ ── K
                    │   AUTH.     │
                    └─────────────┘
```

FIG. 6.

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START

INPUT NAME,
NEW ACCT NO.   A

NAME
MATCH?   B —NO→ RETURN
ERROR   C

YES

CLOSE OLD
ACCOUNT   D

MOVE BAL.
AND NAME TO
NEW ACCT. NO.   E

TRANSMIT
ACKNOWLEDGEMENT   F

FIG. 7.

START

INPUT NAME,
SER. NO.
NEW PIN   A

TRANSMIT
TO ETC
PROCESSOR   B

RETURN
ERROR   D ←NO— INPUT
MATCH ACCT
NO?   C

YES

UPDATE
PIN   E

TRANSMIT
NEW PIN
TO PCAS   F

SEND
ACKNOWLEDGEMENT   G

FIG. 8.

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) : G06F 15/30; G06K 5/00, 19/00, 19/06
US CL :235/379, 380; 902/25, 27
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 235/379, 380; 902/25, 27

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, 4,707,592 (WARE) 17 November 1987, col. 2, lines 25-40; col. 2, lines 40-58; col. 3, lines 22-29; col. 3, lines 29-32; col. 7, lines 17-34; col. 8, lines 26-36; col. 9, lines 1-15; col. 9, lines 55-65; col. 11, lines 36-43; col. 12, lines 33-41; and figures 1A, 1B, 2B, and 5-6.	1, 2-5, and 7-8
Y	US, 5,101,098 (NAITO) 31 March 1992, col. 5, lines 18-47; and figure 1	1 and 7-8
Y	US, 4,766,293 (BOSTON) 23 August 1988, col. 7, lines 15-66; and figure 4.	2
Y, P	US, 5,267,149 (ANADA ET AL) 30 November 1993, col. 6, lines 67+; col. 7, lines 1+; col. 7, lines 1-18; and figures 7a-7b and 8a-8b.	6

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
06 DECEMBER 1994	20 DEC 1994

Name and mailing address of the ISA/US	Authorized officer
Commissioner of Patents and Trademarks	
Box PCT	MICHAEL G. LEE
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Facsimile No. N. A.	Telephone No. (703) 305-3503

Form PCT/ISA/210 (second sheet)(July 1992)*

B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

APS

    Search terms: credit card#, debit card#, ATM card#, prepaid card#, foreign currency, PIN?, database, bank identification number, account number, customer data, currency amount, and automatic teller machine.

Appendix C -- Figures

This Appendix is eleven pages, including this cover page, and contains drawing sheets 1-10 containing a clean copy of each of Figures 1-10.

Figure 1

Figure 2

START

Card Details Entered/Received by Terminal _____ 30

Terminal connects to Authorisation Host _____ 31

Terminal communicates card details to Authorisation Host _____ 32

33
Are Card Details Valid?

Yes

34
Authorisation Code communicated to Terminal

35
Authorisation message outputted from Terminal

36
Proceed with Transaction

No

37

Yes

38
Store Transaction Details in Transactions Table

No

39
Authorisation failure communicated to Terminal

Authorisation failure output from Terminal

40

END

Figure 3

START

Connect to host — 42

Collate and transmit
transaction details to host — 43

Print report — 44

Disconnect from host — 45

END

Figure 4

Extract identifier code from payment card details /50

Compare identifier code with Bank Reference (BRT) table /51

Does BRT Table contain entry for identifier code ? /52

Yes

No

Process Transaction with enhancements using associated currency /54

Process Transaction as per prior art /53

Figure 5

00000	IR£
:	:
:	:
59990	US$
60000	STG
60001	YEN
:	:
:	:
99999	Euro

60 (1 - n)   61 (1 - n)

Figure 6

Figure 7

```
┌─────────────────────────────┐
│ Obtain card number, expiry  │──── 205
│ date and Cardholder name    │
└─────────────────────────────┘
              │
              ▼
         ╱╲  210
        ╱    ╲         No
       ╱ check for╲─────────────────┐
       ╲ entry in ╱                 │
        ╲  BRT   ╱                  ▼
         ╲      ╱            ┌──────────────────┐
           │  215           │ Currency set to  │──── 220
           ▼                │    merchants     │
┌─────────────────────────┐ └──────────────────┘
│ Set to currency of      │          │
│ cardholder              │          ▼
└─────────────────────────┘        ( A )
           │
           ▼
┌─────────────────────────┐
│  get transaction amount │──── 225
└─────────────────────────┘
```

is amount > maximum — 230

is amount < minimum — 240

No

No

Currency set to Cardholders — 245

Yes

(A)

Yes

Process transaction in Merchants currency — 255

Details shown to Cardholder — 265

Accepted ? — 270

Print receipt — 260

No

Yes — 275

END

Process transaction in Cardholders currency

Figure 8

```
        ┌──────────────┐
        │    START     │───── 300
        └──────────────┘
               │
               ▼
    ┌────────────────────────┐
    │   Connect to host      │──── 301
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │   Collate and transmit │
    │ transaction details to host │── 302
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │     Print report       │──── 303
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │  Retrieve amendments to│
    │    abbreviated bank    │──── 304
    │    reference table     │
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │ Update abbreviated bank│
    │    reference table     │──── 305
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │  Retrieve currency rate│
    │      information       │──── 306
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │  Update currency rates │
    │         table          │──── 307
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │    Print out Rates     │──── 308
    └────────────────────────┘
               │
               ▼
    ┌────────────────────────┐
    │  Disconnect from host  │──── 309
    └────────────────────────┘
               │
               ▼
        ┌──────────────┐
        │     END      │──── 310
        └──────────────┘
```

Figure 9

djc2340

START ~400

Receive Authorisation Request
from Terminal ~405

Authorise
Yes/No ? 410 — No

Yes

425 — Is entry in
BIN table
?

No

Send Authorisation
Cancellation Code ~415

Yes

Convert transaction amount to
associated currency ~420

Send Details to Terminal ~435
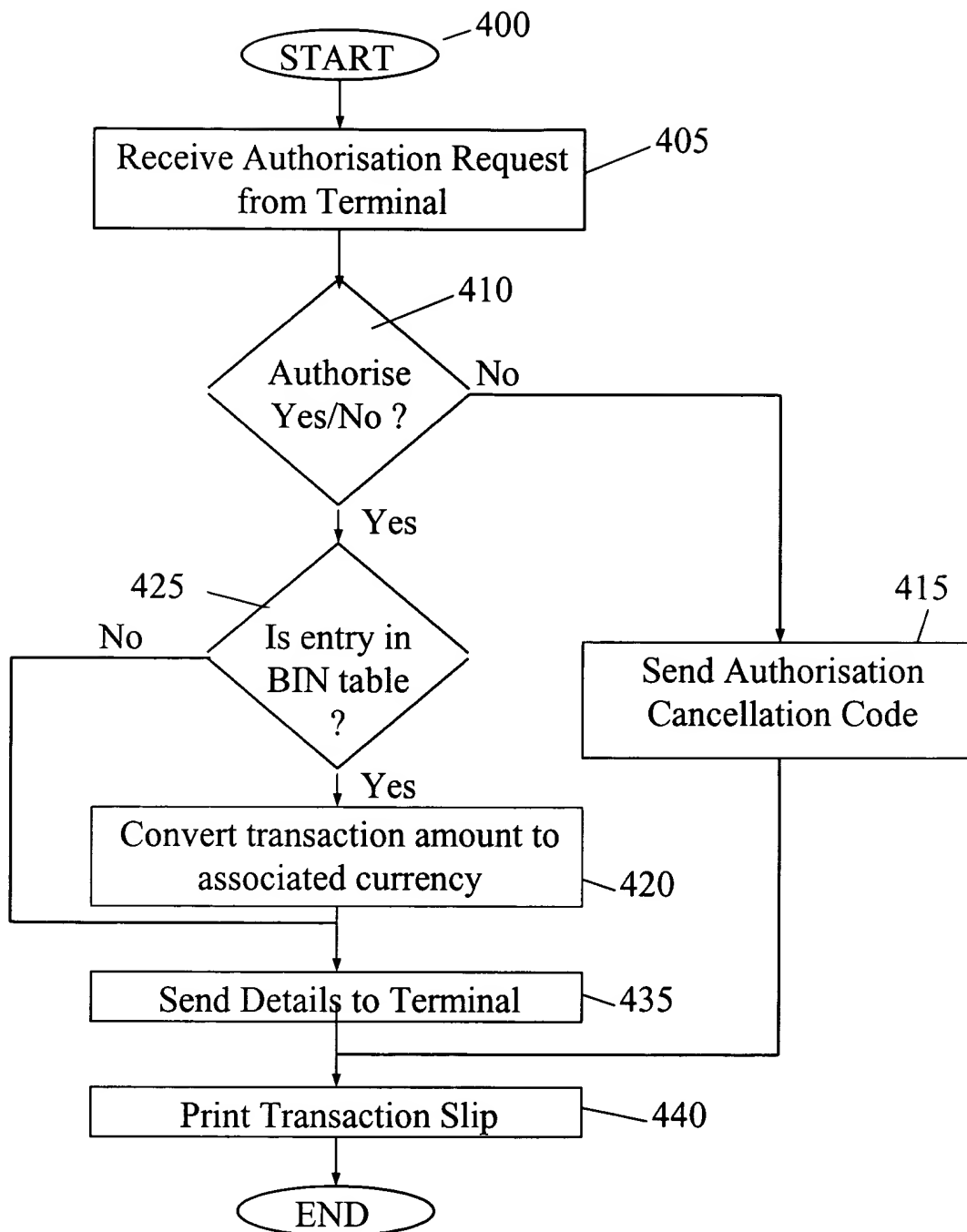
Print Transaction Slip ~440

END

Figure 10

Appendix D – Related Proceedings Appendix

NONE